# ESIP Community Leadership:
# Innovating Throughout the Data Life Cycle



July 17-20, 2012
University of Wisconsin, Pyle Center
Madison, WI

The Federation of
Earth Science Information Partners

# Table of Contents

## *Program Overview*

Welcome to the ESIP Summer Meeting 2012! This meeting will focus on the theme: ***ESIP Community Leadership: Innovation throughout the Data Life Cycle.***

In a recent book on innovation, *The Innovator's DNA*, Jeffrey H. Dyer, Hal B. Gregersen, and Clayton M. Christensen looked for common traits found among people thought to be highly innovative. Their conclusion was that innovators consistently do five things:
- **Questioning** allows innovators to break out of the status quo and consider new possibilities
- Through **observing,** innovators detect small behavioral details—in the activities of customers, suppliers, and other companies—that suggest new ways of doing things.
- In **experimenting** they relentlessly try on new experiences and explore the world.
- And through **networking** with individuals from diverse backgrounds, they gain radically different perspectives.

These four patterns of action together help innovators **associate** to cultivate new insights. Like DNA everyone inherently has these innovation skills, but no person combines them in the same way. Unlike DNA, the skills can also be practiced, innovators consistently act differently to think differently and by understanding these skills innovation organizationally can be enhanced.

The program is laid out by day, starting with an 'at-a-glance' page followed by session micro-abstracts for that day. As we move away from paper programs toward the ESIP Commons electronic program we are compromising with these 140 character micro-descriptions of the sessions. For full abstracts see the website: (http://commons.esipfed.org/schedule/Summer%20Meeting%202012). Throughout the meeting the meeting session pages will continue to grow with presentations presented, notes and action items. The next section in the program is poster abstracts. These are also available on the ESIP Commons (http://commons.esipfed.org/gallery/Summer%20Meeting%202012). We are excited about the extended lifespan the ESIP Commons will provide for this content. The last section of the program is bios, titles and abstracts of our plenary speakers.

This meeting is the first where we have used the **ESIP Commons** to publish meeting content - both session abstracts and posters. There are many benefits to the ESIP Commons, but one of the most immediate is the ability to pivot on content by ESIP collaboration area, person, organization or keyword. We also hope that it will make ESIP contributions more discoverable and reusable.

## *Special Activities around Earth Science Data and Information Innovation*

**ESIP Connections Video Booth** – If you ask ESIP members about benefits they get from participating in ESIP activities and meetings, it always comes back to enabling participants to do their own work better. Many mention these components of innovation in their answers (2012 Winter Meeting Survey) - the benefit of idea exchange, networking or learning new things. These habits and thought processes provide a framework of specific actions and metrics that might be helpful in understanding, explaining to others, what it is about ESIP that makes it a productive space to work and how to continually create an innovative space for the Earth science informatics community to work.

This discussion starts with some ideas from The Innovator's DNA. It will be filled out by stories that members tell! Some questions that might start your thinking:
- What specific events in ESIP have helped members bring innovative ideas back from ESIP meetings to their organizations?
- How have other ESIP members helped to effectively bring those ideas to fruition?
- Is there some element of ESIP's organization that makes it inherently innovative?

**Innovators Among Us Plenary Session** - The second plenary session on Wednesday will be a variety of lightning talks from a group of self-identified innovators in the ESIP community. The speakers where given two choices for format: (1) Ignite-style, 5 minute talks with 20 slides, where the slides auto-advance every 15 seconds or (2) TED-style, 9 minute talks. Both styles lend themselves to creative ideas, boundary-pushing concepts and high energy. To avoid audience fatigue through the 13 speakers we will break ever 20 minutes and have a brief "core dump" at your table where you can jot down the ideas, questions and connections you made during the previous talks.

**Innovators Among Us Follow-up** – On Thursday afternoon from 3:30-5 Karl Benedict will lead a discussion session on ideas, thoughts and challenges that emerged from the plenary session.

Other Breakout Sessions that are supporting the innovation theme are tagged in the ESIP Commons with innovation: http://commons.esipfed.org/taxonomy/term/455

## Housekeeping

**Meeting Locations:** Tuesday, Wednesday afternoon, Thursday and Friday we are in the Pyle Center. Wednesday morning through lunch and the poster session Wednesday evening, we are in Memorial Union, just down the street.

**Poster set-up** is during the morning break on Wednesday, July 18 in Memorial Union Great Hall. Poster presenters are responsible for set-up during the Wednesday break and teardown of posters after the reception. Foundation staff and volunteers are not responsible for lost posters or poster tubes.

**Wireless code**: Wireless codes are available at the registration desk.

**Tweet** with the #ESIPFed hash meeting-related notes, insights, comments, etc. Follow @esipfed for up-to-the-minute meeting info.

Remember the **remote participants**!! We have over 20 remote attendees. Use the microphones, turn on the webcams and engage those that are virtually attending. Thanks in advance for your help making this a great hybrid meeting!!

**QR Code** - Would you rather read this from your phone? The QR code links to a mobile site with links to meeting and ESIP information.



**Birds of a Feather (BOF) –** As the meeting unfolds, often there are topics or sessions you wish you'd planned. If you would like to have a side meeting or ad-hoc breakout session Room 220 starting Wed at 4:00 pm is open for these meetings. It has a projector, but you will need to bring your own computer.

## Meeting Maps

Wednesday, July 18
Memorial Union
- Plenary
- Lunch
- Poster Session

Pyle Center

All other meeting activities
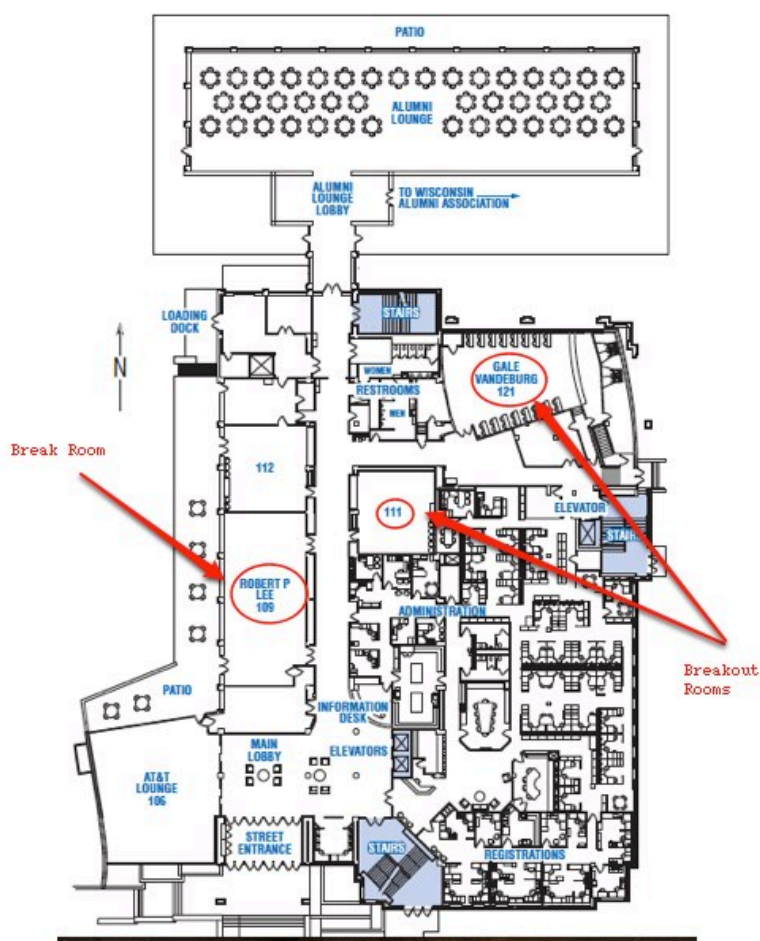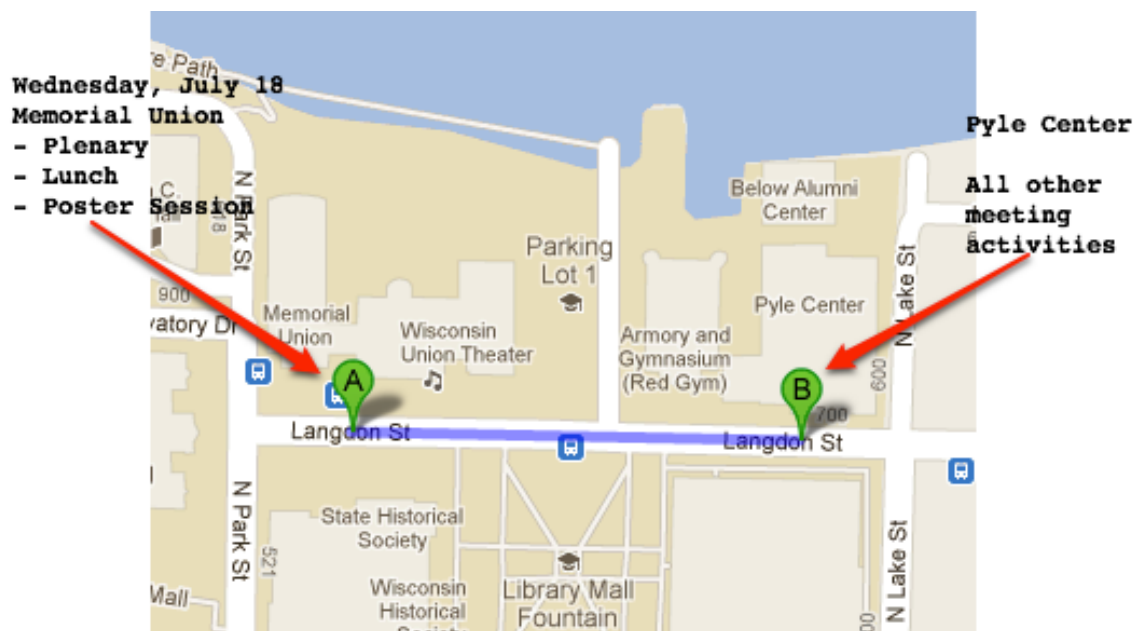
**Pyle Center Level 1:**
109 - Break Room & Registration

Breakout rooms:
111
121
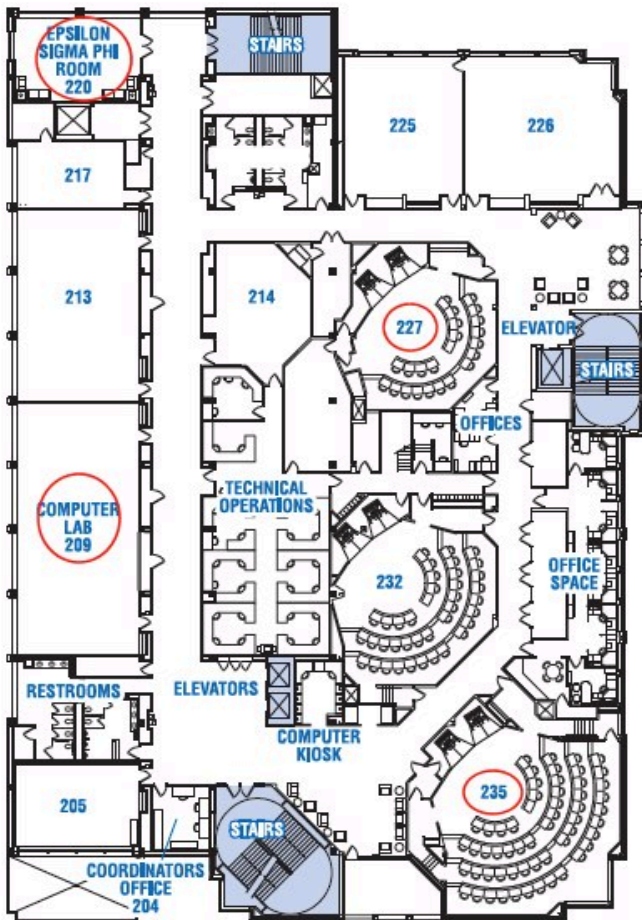
**Pyle Center Level 2:**
209
220 (emergent meetings)
227
232
235

**Pyle Level 3:**
327
332
335

8

# Week At-A-Glance

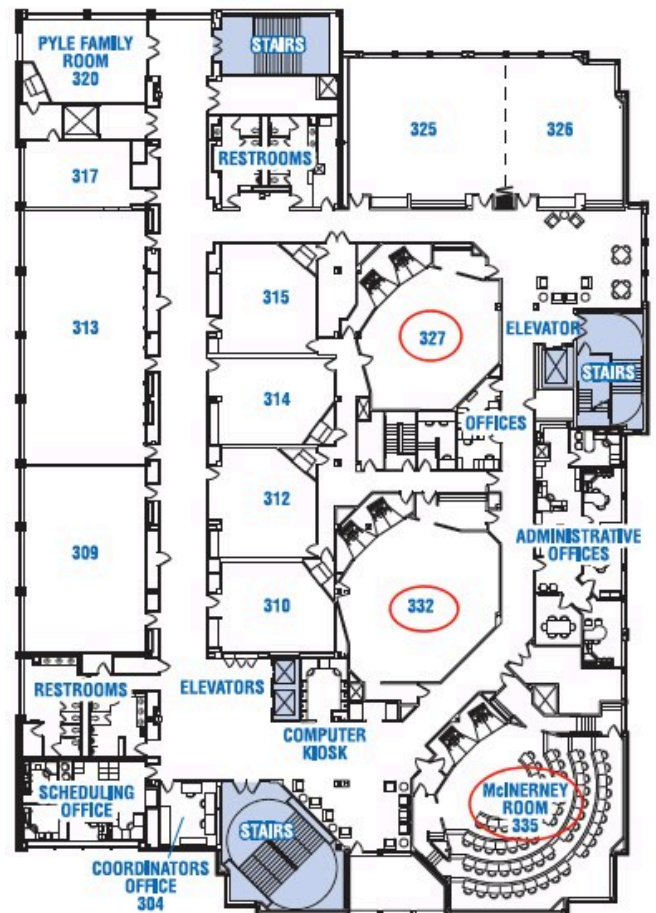| Day 1 - Tue, July 17 | | Day 2 - Wed, July 18 | | Day 3 - Thur, July 19 | | Day 4 - Fri, July 20 | |
|---|---|---|---|---|---|---|---|
| 8:00 | Registration Opens | 8:00 | Registration Opens *Memorial Union* | 7:30 | Registration Opens C&B Meeting | 8:00 | Registration Opens |
| 8:30 | Workshops | 8:30 | Plenary Session *Memorial Union* | 8:30 | Breakout Sessions | 8:30 | Breakout Sessions |
| | | 9:15 | Plenary Session *Memorial Union* | | | | |
| 10:00 | Break | 10:00 | Break | 10:00 | Break | 10:00 | FUNding Friday |
| | | 10:15 | Plenary Session Innovators Among Us *Memorial Union* | | | | |
| 10:30 | Workshops | | | 10:30 | Breakout Sessions | 10:30 | Breakout Sessions |
| 12:00 | Lunch | 12:00 | Lunch *Memorial Union* | 12:00 | Lunch | 12:00 | Lunch |
| 1:30 | Workshops | | | 1:30 | Breakout Sessions | 1:30 | End of Meeting |
| | | 2:00 | Breakout Sessions *Pyle Center* | | | | |
| 3:00 | Break | | | 3:00 | Break | | |
| 3:30 | Workshops | 3:30 | Break | 3:30 | Breakout Sessions | | |
| | | 4:00 | Breakout Sessions *Pyle Center* | | | | |
| 5:00 | End of Day 1 | | | 5:00 | End of Day 3 | | |
| | | 5:30 | Poster Session *Memorial Union* | | | | |
| 7:00 | Pub Crawl | | | | | | |
| | | 7:30 | End of Day 2 | | | | |

| Key | |
|---|---|
| Breakout | |
| Workshop | |
| Plenary | |

\* All times in CDT

**NOTE Locations:**
Wed AM and Wed Poster Session are in Memorial Union

All other sessions are in the Pyle Center

| 8:00 | **Registration Open** | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | *Outside the Robert P. Lee Lounge - Rm 109* | | | | | |
| 8:30 | **E-Science Drupal Lab** | **Evaluating YOUR Project** | **Teacher Workshop** | **ESIP 101** | **NASA Mini-Summit for Open Source** | **EarthCube Governance** |
| | Room: 227 | Room: 121 | Room: 235 | Room:111 | Room: 335 | Room: 332 |
| | B. Caron | A. Prados | M. Mooney | C. Meyer | C. Mattman | L. Allison |
| 10:00 | **Break** | | | | | |
| | Robert P. Lee Lounge - Rm 109 | | | | | |
| 10:30 | **E-Science Drupal Lab** | **Evaluating YOUR Project** | **Teacher Workshop** | **US GIN** | **NASA Mini-Summit for Open Source** | **EarthCube Governance** |
| | Room: 227 | Room: 121 | Room: 235 | Room:111 | Room: 335 | Room: 332 |
| | B. Caron | A. Prados | M. Mooney | S. Richard | C. Mattman | L. Allison |
| 12:00 | **Lunch** | | | | | |
| 1:30 | **Discovery Hack-A-Thon** | **Evaluating YOUR Project** | **Teacher Workshop** | **ESIP Commons** | **DataOne Node** | **EarthCube Governance** |
| | Room: 235 | Room: 121 | Room: 209/327 | Room:111 | Room: 335 | Room: 332 |
| | H. Hua | A. Prados | M. Mooney | K. Benedict | M. Jones | L. Allison |
| 3:00 | **Break** | | | | | |
| | Robert P. Lee Lounge - Rm 109 | | | | | |
| 3:30 | **Discovery Hack-A-Thon** | **Evaluating YOUR Project** | **Teacher Workshop** | **Innovator Practice** | **DataOne Node** | **EarthCube Governance** |
| | Room: 235 | Room: 121 | Room: 209/327 | Room:111 | Room: 335 | Room: 332 |
| | H. Hua | A. Prados | M. Mooney | E. Robinson | M. Jones | L. Allison |
| 5:00 | | | | | | |

# July 17, 8:30-10 am

**Evaluating YOUR Data Management and Earth Science Application Projects -** A hands-on workshop to guide you through key steps and questions used in evaluation of Earth science data & application projects

**Lead:** A. Prados | **Room:** 121 | **Type:** Workshop **| Collab Areas:** Decisions

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**E-Science Drupal Lab -** e-Science #Drupal Lab unConference to answer questions and explore new ideas on Mon and check out new demos Tues AM!

**Lead:** B. Caron | **Room:** 227 | **Type:** Workshop **| Collab Areas:** Drupal Working Group

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**Teacher Workshop -** Teacher Workshop - Educators learn about climate science, climate resources, and ways to effectively communicate climate change topics.

**Lead:** M. Mooney | **Room:** 235 | **Type:** Workshop **| Collab Areas:** Climate Education Working Group, Education

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**EarthCube Governance Steering Committee Meeting -** #EarthCube Governance SC - Working on the Gov Roadmap and next steps

**Lead:** L. Allison | **Room:** 332 | **Type:** Workshop **| Collab Areas:** Earth Science Collaboratory

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**NASA Mini-Summit for Open Source Software and Science -** This session will host a series of #OpenSource for NASA Science Data Systems talks w/strong synergy with the Geospatial Cluster

**Lead:** C. Mattman | **Room:** 335 | **Type:** Workshop **| Collab Areas:** Geospatial

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**ESIP 101 -** New to #ESIPFed? Come get a quick primer on ESIP and find ways to get involved!

**Lead:** C. Meyer | **Room:**111 | **Type:** Breakout **| Collab Areas:** Executive Committee

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# July 17, 10:30-12 pm

**Evaluating YOUR Data Management and Earth Science Application Projects -** A hands-on workshop to guide you through key steps and questions used in evaluation of Earth science data & application projects

**Lead:** A. Prados | **Room:** 121 | **Type:** Workshop **| Collab Areas:** Decisions

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**Lead:** M. Mooney | **Room:** 235 | **Type:** Workshop **| Collab Areas:** Climate Education Working Group, Education

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**EarthCube Governance Steering Committee Meeting -** #EarthCube Governance SC - Working on the Gov Roadmap and next steps

**Lead:** L. Allison | **Room:** 332 | **Type:** Workshop **| Collab Areas:** Earth Science Collaboratory, Information Quality, Preservation and Stewardship

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**NASA Mini-Summit for Open Source Software and Science -** This session will host a series of #OpenSource for NASA Science Data Systems talks w/strong synergy with the Geospatial Cluster

**Lead:** C. Mattman | **Room:** 335 | **Type:** Workshop **| Collab Areas:** Geospatial

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**Implementing USGIN, a Distributed Data Network for Geoscience Information  -** This workshop will provide a case study of USGIN, a framework for sharing geoscience data in a distributed network

**Lead:** S. Richard | **Room:**111 | **Type:** Breakout **| Collab Areas:** Discovery, Geospatial, Information Technology and Interoperability

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## July 17, 1:30-3 pm

**Evaluating YOUR Data Management and Earth Science Application Projects -** A hands-on workshop to guide you through key steps and questions used in evaluation of Earth science data & application projects

**Lead:** A. Prados | **Room:** 121 | **Type:** Workshop **| Collab Areas:** Decisions

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**Teacher Workshop - Breakout Sessions -** Teacher Workshop - Educators learn about climate science, climate resources, and ways to effectively communicate climate change topics.

**Lead:** M. Mooney | **Room:** 209/327 | **Type:** Workshop **| Collab Areas:** Climate Education Working Group, Education

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**Discovery Hack-A-Thon -** Hands-on and simple approaches to using Discovery services - OpenSearch, Collection Casting, Granule Casting, and Service Casting

**Lead:** H. Hua | **Room:** 235 | **Type:** Workshop **| Collab Areas:** Discovery, Earth Science Collaboratory, Geospatial, Information Technology and Interoperability, Products and Services, Semantic Web

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**EarthCube Governance Steering Committee Meeting -** #EarthCube Governance SC - Working on the Gov Roadmap and next steps

**Lead:** L. Allison | **Room:** 332 | **Type:** Workshop **| Collab Areas:** Earth Science Collaboratory, Information Quality, Preservation and Stewardship

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**DataOne Architecture and How to Become a Member Node -** Overview of the @DataONEorg architecture for info mgrs, grad students, post-docs, faculty, research techs who manage env data

**Lead:** M. Jones | **Room:** 335 | **Type:** Workshop **| Collab Areas:** Information Technology and Interoperability

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**ESIP Commons -** Initial ESIP Commons Workgroup meeting. Come voice your opinions on how ESIP content should be preserved

**Lead:** K. Benedict | **Room:**111 | **Type:** Workshop | **Collab Areas:** Commons

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## July 17, 3:30-5 pm

**Evaluating YOUR Data Management and Earth Science Application Projects -** A hands-on workshop to guide you through key steps and questions used in evaluation of Earth science data & application projects

**Lead:** A. Prados | **Room:** 121 | **Type:** Workshop | **Collab Areas:** Decisions

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**Lead:** M. Mooney | **Room:** 209/327 | **Type:** Workshop | **Collab Areas:** Climate Education Working Group, Education

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**Lead:** H. Hua | **Room:** 235 | **Type:** Workshop | **Collab Areas:** Discovery, Earth Science Collaboratory, Geospatial, Information Technology and Interoperability, Products and Services, Semantic Web

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**Lead:** M. Jones | **Room:** 335 | **Type:** Workshop **| Collab Areas:** Information Technology and Interoperability

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**Innovators Among Us Practice –** Dress rehersal for Innovators Among Us Plenary session.

**Lead:** E. Robinson | **Room:**111 | **Type:** Workshop

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## Wednesday, July 18 (Memorial Union, morning and Pyle Center afternoon)

| Time | | | | | | |
|------|---|---|---|---|---|---|
| 8:00 | Registration Open<br>Great Hall, Memorial Union | | | | | |
| 8:30 | **Linked Data and Next Generation Science**<br>Deborah McGuiness, Tetherless World Constellation, RPI<br>Great Hall, Memorial Union | | | | | |
| 9:15 | **Opportunities and Challenges in Crisis Informatics**<br>Lea Shanley, Woodrow Wilson Center, Commons Lab<br>Memorial Union | | | | | |
| 9:45 | **Insights and Opportunities in NASA's Disaster's Program**<br>Frank Lindsay, NASA Headquarters<br>Memorial Union | | | | | |
| 10:00 | Break<br>Memorial Union | | | | | |
| 10:15 | Innovators Among Us<br>Memorial Union | | | | | |
| 12:00 | Lunch<br>Memorial Union | | | | | |
| 2:00 | **EarthCube Workflow**<br>Room: 332<br>Y. Gil | **Frameworks for Data Viz**<br>Room: 227<br>K. Ward | **Teacher Workshop**<br>Room: 209<br>M. Mooney | **Documenting Data**<br>Room: 335<br>T. Habermann | **Innovation through GIS**<br>Room: 235<br>T. Jasmin | **ESIP Testbed**<br>Room: 220<br>K. Keiser |
| 3:30 | Break<br>Lee Lounge | | | | | |
| 4:00 | **ToolMatch Party**<br>Room: 332<br>C. Lynnes | **Frameworks for Data Viz**<br>Room: 227<br>K. Ward | **Teacher Workshop**<br>Room: 209<br>M. Mooney | **Documenting Data**<br>Room: 335<br>T. Habermann | **Innovation through GIS**<br>Room: 220<br>T. Jasmin | **BOF**<br>Room: 220 |
| 5:30 | Poster Session & Reception<br>Memorial Union | | | | | |

**July 18, 2-3:30 pm**

**Teacher Workshop - Wrap-up** - Teacher Workshop - Educators learn about climate science, climate resources, and ways to effectively communicate climate change topics.

**Lead:** M. Mooney | **Room:** 209 | **Type:** Workshop | **Collab Areas:** Climate Education Working Group, Education

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**ESIP Testbed: Encouraging Technology Innovation for Earth Science -** Presentations and discussions about the latest developments and capabilities of the ESIP Testbed

**Lead:** K. Keiser | **Room:** 220 | **Type:** Breakout | **Collab Areas:** Cloud Computing, Discovery, Information Quality, Information Technology and Interoperability, Preservation and Stewardship, Products and Services, Semantic Web

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**Frameworks for Data Visualization -** Many frameworks have been developed to support science data visualization. This session will demo several #viz

**Lead:** K. Ward | **Room:** 227 | **Type:** Workshop | **Collab Areas:**

Visualization

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**Innovation Applied through Geospatial Application -** Focus on demo innovation through geospatial application for integrated discovery, access, and analysis through the use of GIS and remote sensing data

**Lead:** T. Jasmin | **Room:** 235 | **Type:** Workshop | **Collab Areas:** Geospatial

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**EarthCube Workflow -** Developing a strategic plan/vision, and series of vignettes for the ways that workflows play into the ever growing #EarthCube community

**Lead:** Y. Gil | **Room:** 332 | **Type:** Breakout | **Collab Areas:** Climate Education Working Group, Earth Science Collaboratory, Education, Information Technology and Interoperability

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**Documenting Data in Multiple Dialects -** This workshop will address documentation dialects used across ESIP. Candidates include ISO, FGDC, DIF, CF, ACDD, ECHO, and EML.

**Lead:** T. Habermann | **Room:** 335 | **Type:** Workshop **| Collab Areas:** Discovery, Documentation, Information Quality, Information Technology and Interoperability

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## July 18, 4-5:30 pm

**Teacher Workshop - Wrap-up** - Teacher Workshop - Educators learn about climate science, climate resources, and ways to effectively communicate climate change topics.

**Lead:** M. Mooney | **Room:** 209 | **Type:** Workshop **| Collab Areas:** Climate Education Working Group, Education

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**Innovation Applied through Geospatial Application -** Focus on demo innovation through geospatial application for integrated discovery, access, and analysis through the use of GIS and remote sensing data

**Lead:** T. Jasmin | **Room:** 220 | **Type:** Workshop **| Collab Areas:** Geospatial

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**Frameworks for Data Visualization -** Many frameworks have been developed to support science data visualization. This session will demo several #viz

**Lead:** K. Ward | **Room:** 227 | **Type:** Workshop **| Collab Areas:** Visualization

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**ToolMatch Party -** At the #ESIPFed ToolMatch Implemenation Party, we will be populating the system with datasets, tools and the relationships between them.

**Lead:** C. Lynnes | **Room:** 332 | **Type:** Breakout **| Collab Areas:** Cloud Computing, Energy and Climate, Information Technology and Interoperability, Semantic Web

---

**Documenting Data in Multiple Dialects -** This workshop will address documentation dialects used across ESIP. Candidates include ISO, FGDC, DIF, CF, ACDD, ECHO, and EML.

**Lead:** T. Habermann | **Room:** 335 | **Type:** Workshop **| Collab Areas:** Discovery, Documentation, Information Quality, Information Technology and Interoperability

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## Thursday, July 19 (Pyle Center all day)

| 7:30 | Registration Open<br>Outside the Robert P. Lee Lounge - Rm 109 | | | | | |
|---|---|---|---|---|---|---|
| 7:30 | C&B Breakfast - C. Lenhardt<br>Room: 111 | | | | | |
| 8:30 | **Using Tech Tools** | **EarthCube Data Discovery** | **Cloud Comp Big Data Apps** | **Energy/Climate Workshop** | | **BOF** |
| | Room: 235<br>M. Mooney | Room: 332<br>R. Ramachandran | Room: 111<br>T. Huang | Room: 327<br>S. Kumar | Room: 227 | Room: 220 |
| 10:00 | Break<br>Lee Lounge | | | | | |
| 10:30 | **NASA HDF/HDF-EOS** | **EarthCube Cross-Domain Interop** | **Cloud Comp Readiness** | **Energy/Climate Workshop** | **Metadata Casting** | **BOF** |
| | Room: 235<br>J. Lee | Room: 332<br>I. Zaslavsky | Room: 111<br>P. Yang | Room: 327<br>S. Kumar | Room: 227<br>B. Wilson | Room: 220 |
| 12:00 | Lunch | | | | | |
| 1:30 | **Moving Forward ESC** | **Earthcube Gov Rdmap** | **Opportunities for Cloud** | **Air Quality** | **Building GIS Hosting Env.** | **BOF** |
| | Room: 235<br>C. Lynnes | Room: 332<br>L. Allison | Room: 111<br>P. Yang | Room: 327<br>G. Lough | Room: 227<br>M. Austing | Room: 220 |
| 3:00 | Break<br>Lee Lounge | | | | | |
| 3:30 | **Discovery Catalog Open Source** | **EarthCube Brokering** | **Innovators Among Us Debrief** | **Realities of Identifiers** | **OPeNDAP OPULS** | **BOF** |
| | Room: 235<br>K. Casey | Room: 332<br>S. Browdy | Room: 111<br>K. Benedict | Room: 327<br>N. Hoebelheinrich | Room: 227<br>J. Gallagher | Room: 220 |

## July 19, 7:30-8:30 am

**Constitution & Bylaws Breakfast -** Breakfast session to discuss potential changes to #ESIPFed Constitution and Bylaws

**Lead:** C. Lenhardt | **Room:** 111 | **Type:** Business Mtg **| Collab Areas:** Constitution and Bylaws

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## July 19, 8:30-10 am

**Cloud Computing Big Data Applications -** This session focuses on design and implementations of cloud-enabled apps/services

**Lead:** T. Huang | **Room:** 111 | **Type:** Breakout **| Collab Areas:** Cloud Computing, Earth Science Collaboratory, Geospatial, Information Quality, Information Technology and Interoperability, Products and Services, Semantic Web

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**Using Technology Tools to Enhance Collaboration: Solutions from Education Iniatives -** Session will feature tech tools that enable collab without travel as presented by #ESIPFed who use these tools in Edu initiatives.

**Lead:** M. Mooney | **Room:** 235 | **Type:** Breakout **| Collab Areas:** Climate Education Working Group, Education, Internal ESIP Education Working Group

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**Energy/Climate Workshop -** Presentations from USGCRP and Energy Security and Water

**Lead:** S. Kumar | **Room:** 327 | **Type:** Workshop **| Collab Areas:** Energy and Climate

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**EarthCube - Data Discovery, Mining and Access -** This breakout will focus on Data Discovery Mining and Access related issues within #EarthCube.

**Lead:** R. Ramachandran | **Room:** 332 | **Type:** Breakout **| Collab Areas:** Discovery, Semantic Web

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**July 19, 10:30-12 pm**

**Cloud Computing Readiness for Supporting Earth Science -** This session invites the two most comprehensive government studies of cloud computing for geospatial sciences to present the results.

**Lead:** P. Yang | **Room:** 111 | **Type:** Breakout **| Collab Areas:** Cloud Computing, Earth Science Collaboratory, Geospatial, Information Quality, Information Technology and Interoperability, Products and Services

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**Metadata Casting for Data, Services and Event Topics -** A working meeting to discuss standardization of the various casting standards: collection, service, data granules, and events/topics.

**Lead:** B. Wilson | **Room:** 227 | **Type:** Breakout **| Collab Areas:** Earth Science Collaboratory, Geospatial, Information Technology and Interoperability, Semantic Web

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**NASA HDF/HDF-EOS Data for Dummies (and Developers) - Making Data Access Easier -** This is a session for anyone who's interested in handling NASA HDF/HDF-EOS data - into, viz tools perfect for someone who has never used HDF!

**Lead:** J. Lee | **Room:** 235 | **Type:** Breakout **| Collab Areas:** Information Technology and Interoperability

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**Energy/Climate Workshop -** Presentations from USGCRP and Energy Security and Water

**Lead:** S. Kumar | **Room:** 327 | **Type:** Workshop **| Collab Areas:** Energy and Climate

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**EarthCube Cross-Domain Interop -** The goal of cross-domain interop is to enable reuse of data/models outside the original context we will report on the #EarthCube roadmap dev and discuss challenges/opps.

**Lead:** I. Zaslavsky | **Room:** 332 | **Type:** Breakout **| Collab Areas:** Information Technology and Interoperability

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## July 19, 1:30-3 pm

**Opportunities brought by and for Cloud Computing -** This session will discuss the future cloud computing directions in support of Earth sciences

**Lead:** P. Yang | **Room:** 111 | **Type:** Breakout **| Collab Areas:** Cloud Computing, Data Management Training, Earth Science Collaboratory, Energy and Climate, Information Quality, Information Technology and Interoperability, Products and Services, Semantic Web

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**Building a GIS Hosting Environment using Open Source -** GIS Web Services Hosting Environment project's goal is to provide a centralized hosting platform for geospatial data providers to upload and publish their data via OGC Web Services

**Lead:** M. Austing | **Room:** 227 | **Type:** Breakout **| Collab Areas:** Geospatial, Information Technology and Interoperability

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**Moving Forward on the Earth Science Collaboratory -** Join us in a working meeting to plan next steps to move forward with the #ESIPFed Earth Science Collaboratory

**Lead:** C. Lynnes | **Room:** 235 | **Type:** Breakout **| Collab Areas:** Earth Science Collaboratory, Information Technology and Interoperability

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**Air Quality -** Feedback to the CyAir team on #AirQuality interop best practices and metadata discussion

**Lead:** G. Lough | **Room:** 327 | **Type:** Breakout **| Collab Areas:** Air Quality, Documentation

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**EarthCube Governance Roadmap and Workshop -** This breakout will introduce the #EarthCube Governance Roadmap and open to the community for feedback

**Lead:** L. Allison | **Room:** 332 | **Type:** Breakout **| Collab Areas:** Earth Science Collaboratory, Information Quality, Preservation and Stewardship

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## July 19, 3:30-5 pm

**Innovators Among Us Debrief –** Did you enjoy the plenary? This session will be a discussion on how ESIP can further Earth Science data and information innovation.

**Lead:** K. Benedict | **Room:** 111 | **Type:** Breakout **| Collab Areas:** Earth Science Collaboratory, Information Technology & Interoperability, ExCom

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**OPeNDAP OPULS Town Hall -** OPeNDAP OPULS session includes a status report on DAP4 development, discussion on use cases and other aspects of the new capabilities #OpenSource

**Lead:** J. Gallagher | **Room:** 227 | **Type:** Breakout **| Collab Areas:** Discovery, Documentation, Information Technology and Interoperability

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**Discovery Catalog Open Source Software Evaluation -** This session focuses on the case studies of the open source softwares- Geoportal server and EDRN Portal.

**Lead:** K. Casey | **Room:** 235 | **Type:** Breakout **| Collab Areas:** Discovery, Information Technology and Interoperability, Products and Services

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**The Realities of Implementing Identifier Schemes for Data Objects -** Study of nine different identifier schemes by the Data Stewardship Committee resulted in recommendations for use of certain schemes for data objects.

**Lead:** N. Hoebelheinrich | **Room:** 327 | **Type:** Breakout **| Collab Areas:** Data Management Training, Data Preservation, Preservation and Stewardship, Products and Services

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**EarthCube - Brokering: A Way Forward for Global Multi-disciplinary Data Sharing -** This session will report on current #EarthCube brokering, explore some of the current brokering approaches and implementations,and discuss future work

**Lead:** S. Browdy | **Room:** 332 | **Type:** Breakout **| Collab Areas:** Discovery, Earth Science Collaboratory, Geospatial, Information Technology and Interoperability, Products and Services

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## Friday, July 20 (Pyle Center all day)

| 8:00 | Registration Open <br> *Outside the Robert P. Lee Lounge - Rm 109* | | | | |
|---|---|---|---|---|---|
| 8:30 | **Data Stewardship Planning** | **NOAA Data Mgmt Dashboard** | **ESC Hack-A-Thon** | **BOF** | |
| | Room: 235 <br> C. Tilmes | Room: 332 <br> M. Austin | Room: 327 <br> C. Lynnes | Room: 220 | |
| 10:00 | Break & FUNding Friday! <br> Lee Lounge | | | | |
| 11:00 | **Discovery Planning** | **Info Quality Planning** | **BOF** | | |
| | Room: 227 <br> H. Hua | Room: 121 <br> B. Maddux | Room: 220 | | |
| 12:30 | Box Lunch | | | | |

**July 20, 8:30-10 am**

**Data Stewardship Committee Planning Session -** Planning meeting for the next year of #ESIPFed Data Stewardship activites - open to all!

**Lead:** C. Tilmes | **Room:** 235 | **Type:** Business Mtg | **Collab Areas:** Data Management Training, Data Preservation

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**Earth Science Collaboratory Hack-A-Thon -** Join us as we take a collaboration framework RAMADDA out for a spin! Bring your datasets, data tools, or use cases!

**Lead:** C. Lynnes | **Room:** 327 | **Type:** Workshop | **Collab Areas:** Earth Science Collaboratory, Information Technology and Interoperability

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**NOAA Data Management Dashboard -** The NOAA Data Management Dashboard is an effort to improve NOAA data interoperability

**Lead:** M. Austin | **Room:** 332 | **Type:** Breakout | **Collab Areas:** Data Management Training, Information Technology and Interoperability

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## July 20, 10 - 11 am

**FUNDing Friday -** Submit your ideas and possibly win $5k! Details:
http://commons.esipfed.org/node/490

**Lead:**  | **Room:** 109 | **Type:** Workshop **| Collab Areas:** All

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## July 20, 11:00-12:30 pm

**Info Quality Planning -** Interested in Earth science Info Quality? Come restart the #ESIPFed
Info Quality Cluster.

**Lead:** B. Maddux | **Room:** 121 | **Type:** Business Mtg **| Collab Areas:** Information Quality

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**Discovery Planning -** Planning meeting for #ESIPFed Discovery Cluster. Open to all!

**Lead:** H. Hua | **Room:** 227 | **Type:** Business Mtg **| Collab Areas:** Discovery

## *Poster and Demo Abstracts*

*Demos, Testbed projects and Student Fellows are noted in [ ] next to the author name.*
*All posters and demos can be found on the ESIP Commons:*
*http://commons.esipfed.org/gallery/Summer%20Meeting%202012*

**Discovering and Utilizing Coastal Ocean Data via NASA's CMDS** - Edward Armstrong

The NASA Coastal Marine Discovery Service (CMDS) is a NASA ACCESS Project wherein which we seek to aggregate and make easily available a number of critical oceanographic data repositories including (but not limited to) NOAA's ERDDAP, NOAA's IOOS, and NASA's ECCO-II. The project is leveraging heavily on existing open source technologies and platforms including the software resultant from the ACCESS 2007 Virtual Oceanographic Data Center (VODC), as well as several other systems including Apache Solr, OPeNDAP and Apache OODT. One of the key targets of the CMDS project is to easily expose coastal datasets via the EASy GIS toolkit, a mature GIS technology of choice amongst many coastal scientists. This poster provides the current status of CMDS and suggest key areas of future work and activities.

CMDS makes discovery and utilizations of coastal marine resources as transparent as possible. Based on the harvesting of descriptive metadata from external THREDDS and OPeNDAP catalogs a user can query our Solr metadata index (a database) through a number of facets (e.g. by parameter, standard name, data center). Once datasets of interest are discovered the system will connect them via a seamless step to the EASy Netviewer for further visualization, data interrogation and extraction. No other system currently has the capabilities of the complete end-to-end of specific dataset discovery-visualization-utilization of CMDS.

Collaboration Areas: Documentation, Geospatial, Visualization | Keywords: Discovery, Coastal, Satellite Data, Ocean Data, GIS, Visualization | Link: http://commons.esipfed.org/node/599

**The USGS Derived Downscaled Climate Projection Portal: A data rich web application for visualization of climate change indices.** - David L. Blodgett [Demo]

The U.S. Geological Survey has created a visualization portal to present derived climate indices based on high resolution downscaled climate projections. The portal is driven by open source software and relies almost entirely on open standard interfaces for data exchange. Capabilities of the portal include mapping of the spatial patterns of downscaled climate projection indices and visualization of spatially averaged annual time series for a number of political, ecological and hydrological boundaries. Standards implemented as part of the portal include the ISO profile of Catalog Services for the Web, Web Map Services, Web Feature Services, and Sensor Observations Services using a Sensor Web Enablement Common CSV block encoded payload. Software used for the portal includes GeoNetwork, GeoServer, THREDDS data server, ncWMS, ncSOS, OpenLayers, Digraph, and others. While the current version of the portal represents pre-calculated climate indices, future development plans include—and the existing system architecture supports—dynamic generation of indices based on user specified thresholds and

areas of interest.

**ESIP's Data Management Training Modules** - Ruth Duerr, Nancy Hoebelheinrich

For the last year, the ESIP Federation, under the sponsorship of the National Oceanographic and Atmospheric Administration (NOAA) and the Data Conservancy, has been developing data management training modules, short 5-10 minute presentations about a specific data management topic. Modules are contributed by members of the ESIP community and undergo peer review prior to formal publication on the ESIP Commons. This poster describes the types of modules that have been contributed, the process used to review and publish each, and the status of the project as a whole. We also will have a live demo of an example module.

Collaboration Areas: Data Management Training | Keywords: data management, training | Link: http://commons.esipfed.org/node/564

**Scalable Job Management for Data Ingestion** - Gangl, Michael, Nga Chung, Christian Alarcon, Thomas Huang

The Data Management and Archive System (DMAS) is the heart of the PO.DAAC data ingestion process for extracting and cataloging metadata. Due to both increases in nominal processing as well as random spikes of data processing and ingestion (reprocessing, migrations, metadata mining), a system capable of dynamically scaling and processing data is required in order to meet the demands of today as well as the requirements of tomorrow. This poster presents a federated architecture for job assignment and management. In this architecture a communication layer has been inserted as the job assignment layer to enable a horizontally scalable architecture of data ingestion processing. The foundation of this communication layer is Apache ZooKeeper, which provides synchronization and naming services. The job lifecycle manager (a.k.a. Manager) receives and assigns jobs through ZooKeeper. The ZooKeeper, as the bridge between Manager and the ingestion workers, keeps track of job to be processed and their priorities. Ingest workers operate according to ordered jobs in ZooKeeper and their priorities. The resulting architecture allows an arbitrary number of Managers and ingestion workers to be dynamically introduced and removed with zero downtime. This federated architecture of DMAS offers PO.DAAC an elastic approach to job management. Implemented in pure Java, DMAS is now an elastic distributed ingestion system. It currently operates in our clusters at JPL, but because of its elasticity in job framing and portability, it can be deployed in a computing cloud to leverage the cloud's elastic nature.

Collaboration Areas: Cloud Computing | Keywords: Cloud, PODAAC, ZooKeeper, elastic, distributed computing, scalable | Link: http://commons.esipfed.org/node/582

**MODIS Web Services** - Larry Gilliam

MODIS Web Services (MWS) enables users to automate search and retrieval of data products produced by MODAPS through a programmable API. The service supports several standards, including SOAP, OpenSearch, and OGC WCS for immediate processing. The web service has

also been deployed to the LANCE Near Real Time system, for easy programmatic data consumption.

**Detecting Suspended Sediments from Remote Sensed Data in the Northern Gulf of Mexico** - Sara Graves, Danny Hardin, Lamar Hawkins, Matt He, Tammy Smith, Marilyn Drewry, Sandy Ebersole, Anthony Travis, Joel Thorn, Brian Brown

The Sediment Analysis Network for Decision Support (SANDS) project utilized remotely sensed data from Landsat and MODIS, both prior and following landfall, to investigate suspended sediment and sediment redistribution. The satellite imagery was enhanced by applying a combination of cluster busting and classification techniques to color and infrared bands. Results from the process show patterns associated with sediment transport and deposition related to coastal processes, storm-related sediment transport, post-storm pollutant transport, and sediment-current interactions. Imagery prior to landfall and following landfall are shown to the left for Landsat and to the right for MODIS. Scientific analysis and production of enhanced imagery was conducted by the Geological Survey of Alabama. The Information Technology and Systems Center at the University of Alabama in Huntsville was responsible for data acquisition, development of the SANDS data portal and the archive and distribution through the Global Hydrology Resource Center, one of NASA's Earth Science Data Centers.

SANDs data may be obtained from the GHRC at ghrc.nsstc.nasa.gov and from the SANDS data portal at sands.itsc.uah.edu.This project was funded by the NASA Applied Sciences Division

**The Rosetta Stone - Connecting Metadata Dialects** - Ted Habermann

Many documentation questions (who?, what?, where?, how?, and why?) can be answered using and re-using a small number of conceptual ,documentation objects. ESIP partners represent these objects in several different metadata models and XML representations. The shared conceptual foundation allows straight-forward translations of content between these models. These translations allow comparisons between metadata dialects and approaches and point the way towards extensions and revisions of International Standards required to meet the needs of ESIP partners.

**McIDAS-V : Visualization and Analysis Capabilities for JPSS** - Tommy Jasmin [Student Fellow]

McIDAS-V is an open-source, freely available software package for analysis and visualization of geophysical data.Its advanced capabilities provide very interactive, 4-D displays linked to Python-based user defined computation and analysis.McIDAS-V is now Suomi NPP-enabled so

these powerful capabilities to integrate data, analysis, and visualization can now be applied to the nextgeneration of remote sensing instruments of the Suomi NPP/JPSS program.Tools for display and interrogation of VIIRS, CrIS and ATMS have been developed by leveraging capabilities already proven for MODIS, AIRS, IASI, SEVIRI, and GOES,as well as, numerous other environmental satellite, NWP re-analysis and in situ data.Case studies are being used to develop new analysis and product validation techniques in the McIDAS-V environment.This will allow Suomi NPP/JPSS scientists and algorithm developers to analyze and visualize their products, enabling algorithm evaluation, product synthesis, and iterative development.

Link: http://commons.esipfed.org/node/619

## Decision Support Using NASA Data and Dispersion Modeling to Identify Possible Impacts of Prescribed Burns in Alabama - Ken Keiser, Manil Maskey, Nair Udaysankar, Yu-ling Wu, Patrick Glass, Abi Dhakal

A team of air quality modelers and information technologists from the University of Alabama in Huntsville (UAH), working with staff of the Alabama Forestry Commission (AFC), are developing a decision support system to identify potentially harmful and dangerous conditions resulting from prescribed burns.  Using information from permits submitted to the AFC by landowners and certified burn managers, UAH scientists additionally incorporate the use of near real-time NASA satellite observations to produce dispersion models of the planned burns in an effort to determine possible negative impacts on air quality and visibility.   This poster discusses the use of multiple satellite derived aerosol products and land products such as albedo and leaf area index in applications related to atmospheric dispersion, nutrient deposition and air quality modeling.  These applications are developed for near-real time use in a decision support related to emergency and environmental management in the State of Alabama.

Keywords: Fires, Forestry, Air Quality, Dispersion, Forecasting, Decision Support | Link: http://commons.esipfed.org/node/500

## Brokering as a Core Element of EarthCube's Cyberinfrastructure - Siri Jodha S. Khalsa,Mark Parsons,Ruth Duerr,Jay Pearlman,Francoise Pearlman,Steve Browdy,Stefano Nativi [Demo]

We are studying a candidate technology for the EarthCube Cyberinfrastruture called brokering. In a generic sense a broker is an intermediary sitting between a client application and one or more resources. A broker can also interact with multiple clients on behalf of a single resource. What this NSF Concept Award is exploring is a Brokering Framework that serves as an integrating element for many resources, enabling the utilization of these resources by different communities using the protocols, metadata standards, semantics and data formating that are familiar to that community. This presentation discusses the project's current status and the issues being investigated, and contrasts the brokering solution with other approaches for accessing heterogeneous resources.

Collaboration Areas: Discovery, Earth Science Collaboratory, Information Technology and Interoperability | Keywords: interoperability, brokering, cyberinfrastructure | Link: http://commons.esipfed.org/node/618

**Artic Collaborative Environment (ACE)** - Kulkarni, A.; Ramachandran, R.; McEniry, M.; Lin, A.; Tanner, S.; Graves, S. [Demo, Student Fellow]

The Arctic has become a key strategic area because of its geopolitical and geoeconomic importance. It is that estimated that Artic region holds large deposits of oil, natural gas, and large quantities of valuable minerals. Furthermore, with the shrinking of the polar ice cap, new navigation routes are possible to connect North America to Eurasia. These new shorter routes will significantly cut the time and costs of shipping. The ACE project is an international program which brings together groups from nations in the Arctic region enabling broader sharing of resources and producing a system that can serve the region as a whole. The objective of the ACE project is to provide decision support system focused on the changing environment of the Arctic region and to foster collaboration between different national and international agencies.

The ACE system is built using open-source components and utilizes well established interoperability standards to provide a robust architecture for serving curated environmental data. ACE system supports real time/near real time environmental data acquisition and display for situational awareness. A rich internet application client is provided to different user types to exploit these datasets. ACE system stores comprehensive metadata to facilitate search, evaluation and interpretation of these environmental datasets. ACE users can curate and filter datasets that can serve as benchmark datasets for different operational situations. Ancillary information that provide clarity in understanding the situation such as reports, news, social network feeds can be aggregated into the ACE system. One of key ACE system capability is to support both asynchronous and synchronous collaboration. Users can video chat with each other in real time, share screens and even use translation capabilities to collaborate synchronously. Users can collaborate asynchronously with each other by creating online communities and sharing data layers.Link to the ACE System: http://acedemo.itsc.uah.edu/

Collaboration Areas: Earth Science Collaboratory | Keywords: Arctic, Collaboration Environment | Link: http://commons.esipfed.org/node/624

**Towards a Multi-Mission, Airborne Science Data System Environment** - Emily Law, Sean Hardman, Daniel Crichton, Dana Freeborn

NASA earth science instruments are increasingly relying on airborne missions. However, traditionally, there has been limited common infrastructure support available to principal investigators in the area of science data systems. As a result, each investigator has been required to develop their own computing infrastructures for the science data system. Typically there is little software reuse and many projects lack sufficient resources to provide a robust infrastructure to capture, process, distribute and archive the observations acquired from airborne flights.

At NASA's Jet Propulsion Laboratory (JPL), we have been developing a multi-mission data system infrastructure for airborne instruments called the Airborne Cloud Computing Environment (ACCE). ACCE encompasses the end-to-end lifecycle covering planning, provisioning of data system capabilities, and support for scientific analysis in order to improve the quality, cost effectiveness, and capabilities to enable new scientific discovery and research in earth observation. This includes improving data system interoperability across each instrument. A principal characteristic is being able to provide an agile infrastructure that is architected to allow for a variety of configurations of the infrastructure from locally installed compute and storage

services to provisioning those services via the ‚Äúcloud‚Äù from cloud computer vendors such as Amazon.com. Investigators often have different needs that require a flexible configuration. The data system infrastructure is built on the Apache's Object Oriented Data Technology (OODT) suite of components which has been used for a number of spaceborne missions and provides a rich set of open source software components and services for constructing science processing and data management systems.

In 2010, a partnership was formed between the ACCE team and the Carbon in Arctic Reservoirs Vulnerability Experiment (CARVE) mission to support the data processing and data management needs. A principal goal is to provide support for the Fourier Transform Spectrometer (FTS) instrument which will produce over 700,000 soundings over the life of their three-year mission. The cost to purchase and operate a cluster-based system in order to generate Level 2 Full Physics products from this data was prohibitive. Through an evaluation of cloud computing solutions, Amazon's Elastic Compute Cloud (EC2) was selected for the CARVE deployment.

Collaboration Areas: Cloud Computing | Keywords:  | Link: http://commons.esipfed.org/node/513

## Leveraging emerging technologies for spatial data infrastructure/portal serving maps and models - Emily Law, Shan Malhotra, George Chang, Bach Bui, Richard Kim

Instrument technologies for making science observations have advanced considerably with datasets now in the petabyte range for all science domains (such as earth, planetary and others). The scale and complexity of increasing science data, commonly referred to as ‚ÄúBig Data,Äù posts challenges in many aspects for science data systems. For instance, today's image files science data systems manage range from a few gigabytes to hundreds of gigabytes in size with new data arriving every day. Despite this ever-increasing amount of data, science data systems must make the data readily available in a timely manner for users to view and analyze. This poster gives an example how emerging technologies including Web Services, GIS and Cloud are leveraged in a science data portal to address serving large scaled images and models.

Collaboration Areas: Cloud Computing | Keywords: Cloud, GIS, portal, Infrastructure, Big Data | Link: http://commons.esipfed.org/node/518

## Climate Literacy and Energy Awareness Network (CLEAN), A Mechanism for Broader Impacts of Research Efforts - Tamara Ledley, Anne U Gold, Susan M Buhr, Cathryn A. Manduca, Sean Fox, Karin Kirk, Marian Grogan, Frank Niepold, Susan Lynds, Cynthia Howell

Has your research project developed educational materials that feature the new Earth science knowledge and data that your work has produced? Can those materials help students develop a better understanding of the Earth system and climate change science? If so consider submitting your science educational resources to the CLEAN project for review to become part of a vetted collection of educational resources for teaching climate and energy science in grades 6-16.

The CLEAN Pathway (http://cleanet.org) is a National Science Digital Library (http://www.nsdl.org) portal is stewarding a collection of classroom activities, lab demonstrations, videos, visualizations, simulations and more. Each resource is extensively reviewed for scientific

accuracy, pedagogical effectiveness, and technical quality. Once accepted into the CLEAN collection, a resource is aligned with the Climate Literacy Essential Principles for Climate Science, the Energy Literacy Essential Principles, the AAAS Project 2061 Benchmarks for Science Literacy and other national standards. The CLEAN website hosts a growing collection of currently ~360 resources that represent the leading edge of climate and energy science resources for the classroom.

This poster will describe the components of the CLEAN effort, including the vetted collection, information to help educators improve their own climate and energy literacy and how to effectively integrate the climate and energy principles into their teaching; and the review process that can enable your climate and energy science educational resources and technology tools to be made available through the CLEAN portal.

**What's New at the HDF-EOS Tools and Information Center Website** - Joe Lee

In the past 3 years, The HDF Group has developed tools and examples aiming to improve the usability of NASA HDF and HDF-EOS data files. All those tools and examples are available through the HDF-EOS Tools and Information Center Website (http://hdfeos.org). This poster highlights the new additions and updates at the website such as the new H4CF conversion toolkit (http://hdfeos.org/software/h4cflib.php), the re-engineered HDF5 OPeNDAP handler (http://hdfeos.org/software/hdf5_handler.php), and the up-to-date comprehensive examples page (http://hdfeos.org/zoo).

The H4CF conversion toolkit includes a conversion Library which provides APIs to access the NASA HDF4/HDF-EOS2 objects by following the CF conventions. In addition, the toolkit also provides the HDF4/HDF-EOS2 to netCDF-3 and netCDF-4 classic converters based on the conversion library.

The re-engineered HDF5 OPeNDAP handler supports the easy access (visualization and analysis) of NASA HDF-EOS5 and HDF5 products via OPeNDAP. It supports current NASA HDF-EOS5 and HDF5 products by following the CF conventions. For example, the Aura HDF-EOS5 products, MEaSUREs SeaWiFS, GSSTF and Ozone products, and Aquarius product can be accessed by netCDF Java tools such as IDV and Panoply.

The Comprehensive Examples page provides a full programming source code of visualizing NASA HDF/HDF-EOS data in MATLAB, IDL, and NCL. The page covers various products such as MABEL, Aquarius, AURA OMI/TES/MLS/HIRDLS, MODIS, MISR, AIRS, CERES, MEaSUREs, TRMM, AMSR_E, AVHRR, QuikSCAT, SeaWiFS, MOPITT, CloudSAT, etc. from data centers like GES DISC, ICESat-2, NSIDC, LAADS, LP DAAC, NSIDC, LaRC, PO.DAAC, etc. The HDF-EOS website user communities help us to improve the quality and performance of these examples as well as to add the new products such as Aquarius and MABEL.

The website not only provides many other useful tools and programming examples to access NASA HDF/HDF-EOS data but also compiles a list of important links related to the NASA HDF/HDF-EOS data.

**AeroStat: Online Platform for the Statistical Intercomparison of Aerosols** - Christopher Lynnes [Demo]

Several different satellite instruments measure Aerosol Optical Depth, yet they often do not agree with each other, nor with in situ measurements. The Aerostat tool was developed in order to provide a platform for investigating these variations. Built on the Giovanni platform, it supports intercomparisons of aerosol measurements from the Multi-Angle Imaging Spectroradiometer (MISR) and the two Moderate Resolution Imaging Spectroradiometer (MODIS) instruments, as well as ground measurements from the AErosol RObotic NETwork (AERONET). In addition, Aerostat includes an optional neural-network-based statistical adjustment of biases. Aerostat also supports the merging and map display of multiple level 2 (satellite swath) aerosol datasets, with optional bias adjustment. The result is a capability to support intercomparisons and merging at a level not seen before in an online tool.

**Beyond an image: using ontology and visualization to enrich Web Map Service for geosciences** - Xiaogang Ma, Peter Fox [Demo]

Web Map Service (WMS), a standard protocol published by the Open Geospatial Consortium (OGC), has been increasingly used in the geoscience community for publishing maps on the Internet. A data provider can upload a map (e.g., a shape file) on a data server and register WMS for it, then users can browse the map as an image and retrieve attributes of polygons on the map. WMS provides a quick way to browse maps online, however, as the spatial data returned from the server is a static image, it's hard to conduct spatial analysis and further applications. In this study we seek approaches to enrich the functionalities of WMS by using ontologies and visualization techniques. An experiment was carried out with WMS of geological maps themed on rock ages. We developed an ontology of geological time scale and an animation to visualize the ontology. We then deployed the ontology and animation together with WMS of rock age maps and developed functions for interactions between them. Our work is still ongoing, and the current results enrich WMS on two parts. One is on spatial data. Style information of a WMS map layer can be retrieved from the server and then be loaded into the animation. The layout of the animation will be changed, making it as a legend and also a control panel for interactions with the map layer. Users can click nodes of rock age concepts in the animation to filter out corresponding spatial features (i.e., polygons) on the WMS map layer. In this procedure the animation refers to the ontology for inter-relationships between rock age concepts. Another part of enrichments is on attribute data service. The ontology includes detailed annotations for rock age terms. When users click a polygon on the WMS map layer and obtain rock age descriptions of that area, the developed functions will recognize the rock age term, retrieve annotations of the term from the ontology and show them on the user interface. This study shows that ontologies and visualization techniques are functional to enrich WMS for geoscience maps. Further developments and deployments of this work will consider end user needs and a case study can be conducted.

**An Understanding Framework for NASA Open Source Software** - Chris Mattmann, Robert Downs, Paul Ramirez, Cameron Goodale, Andrew F. Hart

Over the course of the past five years we have researched, developed, and evaluated an open source undrstanding framework for NASA and other government software. The framework is based on a handful of dimensions involving licensing, redistribution, commercialization, attribution, community models, architecture, and some others. We have leveraged the framework to both chart out, and to evaluate the process of open sourcing software at the agency, both from a consumption perspective, and from a production perspective.

The framework is currently being leveraged to evaluate the most appropriate areas for the production and consumption of open source software within NASA's Earth Science Data System enterprise, and is serving as groundwork for understanding the process at other agencies including the NSF, the NIH/NCI, and the DOD.

**STOQS: The Spatial Temporal Oceanographic Query System** - Mike McCann
[Demo]

With increasing measurement and sampling capabilities of Autonomous Underwater Vehicles (AUVs), the need to efficiently access and visualize the data they collect is also growing. The Spatial Temporal Oceanographic Query System (STOQS) has been designed and built to provide efficient access and visualization of in situ oceanographic measurement data across any dimension. STOQS is an open source software project built upon a framework of free and open source software for geospatial data. STOQS complements CF-NetCDF and OPeNDAP by providing an ability to index data retrieval across parameter and spatial dimensions in addition to thea prioriindexed coordinate dimensions of CF-NetCDF . It also provides a functional bridge to standards-based GIS technologies. This poster provides a brief overview of the project which is available at http://code.google.com/p/stoqs/.

**Underwater Predictive Modeling for submerged archeological sites off Prince of Wales Island, SE AK** - Kelly Monteleone [Demo, Student Fellow]

Synthesis and interpretation of archaeologically documented settlement patterns and ethnographic data are used to identify and model where people chose to live, hunt, and gather prehistorically. This project tests the hypothesis that the archaeological record of SE Alaska extends to areas of the continental shelf that were submerged by post-Pleistocene sea level rise beginning around 10,600 cal yrs BP (9,400 RCYBP). A digital elevation model (DEM) and sea-level curve for southeastern Alaska are used to create time slices between 18,100 to 10,600 cal

yrs BP. The variables (slope, aspect, distance from paleo-stream, paleo-lakes, paleo-coastlines, and known archaeological sites, and type of coastline) included in the predictive model are incorporated and presented in the final model identifying the high potential areas. This model will be used to identify high potential survey areas for underwater archaeological surveys during the next three years (NSF Polar Programs -#1108367).Poster Presented at the Alaska Anthropology Association Annual Meeting March 2012

**NASA Reverb: Metadata-Driven Earth Science Data Discovery** - Doug Newman, Katie Baynes

NASA's Earth Observing System Data and Information System (EOSDIS) is a core capability in NASA's Earth Science Data Systems Program. The EOSDIS contains 12 data centers each responsible for stewardship over separate scientific domains. A core function of the EOSDIS is to facilitate the discovery, access, and interpretation of data that is collected by the EOSDIS. NASA's EOS ClearingHOuse (ECHO) is a metadata catalog for the EOSDIS data centers, providing a centralized catalog of data products and registry of related data services.

Earth scientists can access EOSDIS data and services by using general or community-tailored clients that access ECHO's data and service holdings. WIST, the Warehouse Inventory Search Tool, has been the primary web-based client for discovering and ordering cross-discipline data from all of ECHO's metadata holdings for many years and has served the Earth Science community well. Working closely with this community, the ECHO team identified a need to develop the next generation EOS data and service discovery tool.

The ECHO Team based their client development efforts on the following principles:
- Metadata Driven User Interface:Users should be presented with data and service discovery capabilities based on dynamic processing of metadata describing the targeted data.
- Integrated Data & Service Discovery: Users should be able to discovery data and associated data services that facilitate their research objectives.
- Leverage Common Standards: Users should be able to discover and invoke services that utilize common interface standards.

After a yearlong design, development, and testing process, the ECHO team successfully released "Reverb: The Next Generation Earth Science Discovery Tool." Reverb was developed in a fast- paced agile development process requiring constant interaction between the developers, product owners, customers, and end-users. Reverb provides a success story of close community involvement to produce an enhanced earth science discovery platform.

Metadata plays a vital role facilitating data and service discovery and access. As data providers enhance their metadata, a user's search experience may also be enriched, as they are able to discover items of interest using more advanced search capabilities. Reverb's reliance on metadata provides a dynamic experience to users based on identified search facet values extracted from science metadata. Utilizing cross-dataset correlation and search based on provided metadata values, users can discover additional dataset that they may not previously have been aware of.

Data discovery and access is not limited to simply the retrieval of data granules, but is growing into the more complex discovery of data services. These services include, but are not limited to, services facilitating additional data discovery, subsetting, reformatting, and re-projecting. The discovery and invocation of these data services is made significantly simpler through the use of consistent and interoperable standards. Sample standards include the OGC and OPEnDAP protocols. By utilizing an adopted standard, developing standard-specific adapters can be utilized to communicate with multiple services implementing a specific protocol.

Through Reverb, users may discover services associated with their data of interest. When services utilize supported standards and/or protocols, Reverb can facilitate the invocation of both synchronous and asynchronous data processing services. This greatly enhances a users ability to discover data of interest and accomplish their research goals.

Extrapolating on the current movement towards interoperable standards and an increase in services, the ultimate goal is to provide a ubiquitous experience for users when discovering data. Services will become a natural part of data discovery, reducing users needs to be aware of the service that is facilitating their data access. The Reverb discovery tool provides a platform to shift the earth science data discovery paradigm.

Keywords: earth science, NASA, reverb, metadata | Link: http://commons.esipfed.org/node/522

**GCMD/IDN: Advances in Keyword and Metadata Interoperability** - Lola Olsen, Thomas Northcutt, Scott Ritz, Thomas Cherry, Shahrukh Areu, Rosy Cordova, Chris Gokey, Monica Holland, Hoan-Vu Tran-Ho, Alicia Aleman, Laurel Cepero, Michael Morahan, Tyler Stevens, Stephanie Grebas [Demo]

The GCMD staff announced the release of GCMD/IDN Version 9.8.3.1 on June 12, 2012. This release represents a significant change in the functionality of the GCMD through the use of the new Keyword Management System (KMS). The KMS introduces a completely new paradigm for the use and management of the GCMD's keywords. In addition, the new Metadata Web Service (MWS) offers a RESTful web service that provides ‚Äúdynamic query access‚Äù to the GCMD metadata collection. The ‚ÄúNext Generation‚Äù web search portal leverages the KMS by offering a sophisticated ‚Äútree refinement‚Äù option. Other features, which are built on top of KMS and MWS, include the free-text search, science keyword search, and the docBUILDER metadata authoring tools that are currently utilized by organizations throughout the world. We will present a live demonstration of the KMS and MWS services as well as the ‚ÄúNext Generation‚Äù web search portal.

- GCMD: http://gcmd.nasa.gov
- Next Generation GCMD Portal: http://gcmd-option.gsfc.nasa.gov/nextgen/
- KMS: http://gcmdservices.gsfc.nasa.gov/kms/capabilities
- MWS: http://gcmdservices.gsfc.nasa.gov/mws/capabilities

[Please Note: KMS and MWS require authentication. Please link to https://urs.eosdis.nasa.gov/ to create an account]

Collaboration Areas: Information Technology and Interoperability | Keywords: metadata, Semantic Web, Keywords, SKOS, OWL, RDF | Link: http://commons.esipfed.org/node/556

**A Public Cloud-Based Portal for Ontology Management and Distribution** - Line Pouchard, Michael Huhns, Andrew Depriest [Demo, Testbed]

Testbed Semantic Web Cluster Report

**Curated Data Albums for Earth Science Case Studies** - Rahul Ramachandran, Helen Conover, Michael McEniry, Ajinkya Kulkarni, Michael Goodman, Bradley Zavodsky, Scott Braun, Brian Wilson

Case study analysis and climatology studies are common approaches used in Atmospheric Science research. Research based on case studies involves a detailed description of specific weather events using data from different sources, to characterize physical processes in play for a given event. Climatology-based research tends to focus on the representativeness of a given event, by studying the characteristics and distribution of a large number of events. To gather relevant data and information for case studies and climatology analysis is tedious and time consuming; current NASA Earth Science data systems are not suited to assemble multi-instrument, multi mission datasets around specific events. For example, in hurricane science, finding airborne or satellite data relevant to a given storm requires searching through web pages and data archives. Background information related to damages, deaths, and injuries requires extensive online searches for news reports and official storm summaries.

We are currently working on developing knowledge synthesis engine to create curated "Data Albums" to support case study analysis and climatology studies. The technological challenges in building a reusable and scalable knowledge synthesis engine are several. First, how to encode domain knowledge in a machine usable form? This knowledge must capture what information and data resources are relevant and the semantic relationships between the various fragments of information and data. Second, how to extract semantic information from various heterogeneous sources including unstructured texts using the encoded knowledge? Finally, how to automatically design of the structured database based the encoded knowledge to store all information and data fragments in queryable form? The structured database must allow both knowledge overviews of an event as well as drill down capability needed for detailed analysis. We are utilizing an application ontology driven framework to build the knowledge synthesis engine.Our effort will deploy curated Data Albums for two science research areas. The first instance will be a portal for hurricane case studies at the Global Hydrology and Resource Center (GHRC), a NASA Data Center. This portal will auto-generate Data Albums for specific hurricane events, compiling information from NASA field campaign collections and other sources. The second instance will be customized to support NASA's Short-term Prediction Research and Transition (SPoRT) Center in compiling case studies to evaluate the performance of numerical weather prediction tools for convective weather events.

**Qualitative Study of Data Preservation Practices at State Geological Surveys (2009)** - Sarah Ramdeen [Student Fellow]

NOTE: This poster was previously presented at the Archival Education and Research Institute (AERI) in July 2009.

In 2007 the USGS started the National Geological and Geophysical Data Preservation Program (NGGDPP). In the second phase of this program the NGGDPP awarded grants to 29 state geological surveys to develop long range plans for data preservation and create metadata for their holdings which were to be uploaded in to the newly created national catalog for geological data sets. The USGS identified a need for the preservation of geological data and encouraged states to develop plans to sustain their data into the future. However, it is common for this task to be assigned to a professional geologist who has not been specifically trained in the methods of access and preservation.

This research will address the question of how these non-archivists developed long range preservation plans. Interviews were conducted with 6 of the 29 collection managers for state surveys taking part in the NGGDPP granting program in 2008. During these interviews they were asked questions about the problems they faced with their collections, what preservation means for their organization, the significance of their collections, what resources they used in making decisions on preservations and important issues they discovered about preservation.

This project is relevant to the development of new methods for preservation of materials in the field of geology. It is important to discover what types of resources these subjects reference and where they go for information as well as what their information needs are for this area. There is currently very little literature on the preservation methods of Geologists. By conducting this research it will help shed light on this area of work and learn more about what research needs to be done in this field.

Keywords: geoscience, preservation, archives, qualitative research | Link: http://commons.esipfed.org/node/555

**Interpretation of Real-time Weather and Climate for Spherical Displays** – Patrick Rowley, Margaret Mooney

The *Interpretation of Real-time Weather and Climate for Spherical Displays* (**EarthNow**) project from the Cooperative Institute for Meteorological Satellite Studies (CIMSS) allows Science On a Sphere (SOS) institutions to go beyond the scientific facts to create meaningful visitor experiences about weather and climate connections. CIMSS, in collaboration with the NOAA Environmental Visualization Lab and the Cooperative Institute for Climate and Satellites, regularly updates a blog-style website, providing a central location for SOS facilitators to find timely weather and climate stories to speak about how current events affect and are affected by global change. Along with these stories, the website also provides relevant, visually appealing SOS-formatted datasets and animations with appropriate annotations, leading to easier comprehension by presenters and the public.

Collaboration Areas: Climate Change Education, Education, Visualization | Keywords: Science On a Sphere, Global, Visualization, Real-time, Weather, Climate, Sphere, Musuem, education, Informal Education | Link: http://commons.esipfed.org/node/623

**ESSI-LOD: A Crystallization Point for Linked Data in the Geosciences** - Eric Rozell, Tom Narock   [Student Fellow]

Linked data is a paradigm for publishing data on the Web by using, among other things, non-proprietary data formats and resolvable identifiers for things in your dataset. One linked data initiative, DBPedia, is widely used as a "crystallization point" for linked data on the Web. It serves as a hub for data-level links from external datasets covering a broad variety of domains. Our project, ESSI-LOD, has converted more than 100,000 abstracts from the American Geophysical Union (AGU) into linked data using the Resource Description Framework, a graph-based data format. We have used this project to help visualize connections between members of the ESIP community, and within the broader Geosciences communities that attend AGU conferences. ESSI-LOD has uncovered a few key challenges when publishing linked data at scale, such as co-reference resolution (i.e., knowing when two authors or organizations are actually the same thing).

Beyond those challenges, we see ESSI-LOD as its own crystallization point for linked data in the geosciences. Like the Wikipedia data DBPedia is derived from, AGU publications have extremely broad coverage of topics in the geosciences. Some opportunities to build out this "ESSI-LOD cloud" include the ability to annotate abstracts, provide links to referenced tools or datasets, and to enable a crowd-sourcing approach to co-reference resolution. Terms from the SWEET ontology can be used to tag publications and datasets to improve information retrieval. Identifiers from Geonames can be used to annotate datasets and publications so that people interested in a spatial domain can quickly discover them. There are numerous ways to crystalize linked data from ESSI-LOD. This poster will briefly highlight the work accomplished in ESSI-LOD and discuss the directions we hope to take it in the future.

This project was funded by a 2011 ESIP Funding Friday award.

Collaboration Areas: Semantic Web | Keywords: Linked Data | Link: http://commons.esipfed.org/node/565


**Computer-based Games, Interactive Simulations and Virtual Labs for STEM Teaching and Learning** - Randy Russell [Demo]

Interactive computer-based simulations, 'serious' games, and virtual labs are being developed and used with growing frequency in a range of education disciplines at all age levels. These resources are employed across formal education, informal education, and educational outreach settings. This poster will present a web-based compendium of games and simulations from various sources which span the STEM (Science, Technology, Engineering and Mathematics) content disciplines. Although there are several good online collections of such resources focused on specific topics (e.g. astronomy education) or from specific sources (e.g. NOAA's games web site), we believe this web site is the first to present such a collection spanning the gamut of sources and STEM content disciplines.

Collaboration Areas: Climate Education Working Group, Education | Keywords: games, simulations, education, virtual labs, virtual laboratory, serious games, educational games, educational simulations, learning games | Link: http://commons.esipfed.org/node/613


**A Probabilistic Approach to Understanding the Rain-Snow Transition in Future Climates** - Eric A. Sproles, Anne W. Nolin  [Student Fellow]

Snowpack in the maritime climate of the Western Oregon Cascades is highly sensitive to temperature. Projected future warming in the region would shift the present rain-snow transition zone up in elevation, resulting in a diminished snowpack for this snow-dominated system. We present a probabilistic approach to characterize the temporal and spatial variability of snowpack and the delivery of precipitation in both present and projected climates. The dimensionless ratio of Snow Water Equivalent (SWE) to cumulative precipitation (P; with the ratio referred to as SWE/P hereafter) minimizes the effects of variable precipitation, while still accounting for the impacts of warmer temperatures on snowmelt. In the McKenzie River Basin in the Western Oregon Cascades, SWE/P was calculated from distributed modeled results. These results were compiled at monthly, seasonal, annual, and multi-year time steps for water years 1990 ,Äì 2011. This temporal range includes seasons with above average, normal, and below average precipitation and ones influenced El Ni√±o/La Ni√±a-Southern Oscillation (ENSO) events. For the future climate scenarios, the meteorologic model inputs (specifically temperature and precipitation) were perturbed using statistically downscaled regional climate projections through 2099 as described in the IPCC-AR4. The cumulative and exceedence probabilities of SWE/P were calculated for twelve sub-watersheds of the McKenzie River and for each 100m-grid cell of the model domain in present and projected climate conditions. This probabilistic approach highlights which sub-basins would be most affected by projected warmer climates. The grid-based calculations provide a probabilistic estimation of where the spatial and temporal dynamics of snowpack accumulation and ablation will be most affected by projected warmer climates. This knowledge helps improve the understanding of precipitation and snowmelt, both of which are first-order contributors to streamflow. Additionally, it provides an informed analysis to help locate sites for an improved snow and meteorologic monitoring network.

**Digital Earth Watch and Picture Post Network** - Annette Schloss, John Pickle, Jeff Beaudry, Alan Gould, Fabio Carrera

The Digital Earth Watch (DEW) environmental monitoring project is a citizen science initiative funded by NASA to create opportunities for informal and formal science educators and the community-at-large to collaborate by sharing digital photographs from Picture Post sites. A key message in DEW is that although plants are dynamic and respond continuously to their environment, they do so either on a time-scale that most people don't notice or with a subtlety our senses can't detect. DEW has a revamped website and a new eBook, "All About DEW" that is full of activities and challenges for students. Picture Post activities involve students and citizens in local environmental monitoring by 1) taking digital photographs at a designated Picture Post site in a consistent, sequential order, 2) uploading the digital photographs to the Picture Post website, 3) examining the digital photographs using the image analysis tools on the Picture Post website, 4) continuing to take photos on a regular basis, and 5) sharing digital photographic records with community organizations dedicated to environmental monitoring and use. A Picture Post is simply an octagon placed in the center of a flat surface and secured to a post anchored in the ground or onto a building. The edges of the octagon allow positioning of the camera so the complete landscape may be photographed in less than a minute. DEW and Picture Post comprise a rich set of materials and a growing network of engaged participants that meet the needs of educators and citizens alike in learning about environmental change.

**Real-time Data and Communications Services of NCAR's Earth Observing Laboratory** - Christopher Webster, Mike Daniels, Greg Stossmeister

Near real-time information is critical for mission management of atmospheric observing systems. Advances in satellite communications and Internet distribution have allowed the Earth Observing Laboratory (EOL) of NCAR to provide data, information and imagery to the scientists during evolving weather situations. Real-time data are necessary for updating interactive displays that show products from forecast models and many disparate observation systems (e.g. satellite, soundings, lightning data, surface radars and aircraft in-situ observations). At the same time, network-based collaborative tools such as IRC chat and web conferencing facilitate interactive participation between remote groups of scientists, engineers, operations centers and the observing platforms.

In the PREDICT deployment of the NSF/NCAR GV research aircraft, dropsondes were released from the aircraft at 45,000 ft over a 1000 km x 1000 km area to give profiles of pressure, temperature, humidity and wind below the aircraft. Real-time data from the sondes was collected by the aircraft and relayed by satcom into the Global Telecommunications System (GTS) and assimilated into forecast models. The model forecast results were then fed back into ground-based and airborne displays (along with a multitude of observations) for enhanced mission decision-making and guidance.

This environment of streaming data in real-time also allows more experts to look at data and compare it with other measurements. One particular benefit is that it alerts instrument operators on the ground and in the air to instrument problems, which can then be addressed very rapidly. The resulting communications and collaborations infrastructure results in unprecedented improvements to our data quality and rapid targeting of mission resources to important weather events.

Collaboration Areas: Decisions, Earth Science Collaboratory, Geospatial, Products and Services, Visualization | Keywords: real-time aircraft observational data mission control situational awareness | Link: http://commons.esipfed.org/node/505


**NEON: Transforming Environmental Data into Information for Societal Benefit** - Brian Wee, Mike Stewart

The National Ecological Observatory Network (NEON) ("the Observatory"), is a NSF funded national investment in physical and information infrastructure. The Observatory's goal is to enable understanding and forecasting of the impacts of climate change, land use change and invasive species on continental-scale ecology by providing physical and information infrastructure to support research, education and environmental management in these areas. NEON provides vetted and authoritative data and information to scientists, educators, decision makers and the public on how land use, climate change and invasive species affect biodiversity, disease ecology, and ecosystem processes. NEON high-level data products are designed to enable ecological forecasts and analyses at a continental scale and facilitate the observation of decadal scale changes against a background of seasonal-to-interannual variability.  We foresee an ecosystem of government, NGO, and academic data sources that will serve as credible producers of linked data, promote data sharing, and champion responsible data life cycle

management. This, together with interoperability initiatives and web-enabled tools, will open up the marketplace of ideas on ways to synthesize ecological data into meaningful information for societal benefit. The poster outlines a framework for transforming data into information to help inform resource management, socio-economic analyses, environmental risk management, and decision support for climate change mitigation and adaptation.

Collaboration Areas: Earth Science Collaboratory, Energy and Climate| Link: http://commons.esipfed.org/node/595


**Discovery Cluster Testbed Geoportal** - Christine White  [Demo, Testbed]

The ESIP Discovery Cluster has been working in collaboration with Esri to develop a service validation capability based on the Esri Geoportal Server. An initial operating capability is available as an Amazon Web Service at http://23.23.211.222:8080/geoportal - as an anonymous user you can search for resources, but with an account you can validate and make known data (and data casts) and services (and service casts). You can try out the implementation at the live demo during the poster session.

Collaboration Areas: Discovery | Keywords: Discovery, service, cast, geoportal, esri | Link: http://commons.esipfed.org/node/611

**Linked Data and Next Generation Science**
*Deborah McGuinness, TWC, RPI, dlm@cs.rpi.edu*

Dr. Deborah McGuinness is a leading expert in knowledge representation and reasoning languages and systems and has worked in ontology creation and evolution environments for over 20 years. Most recently, Deborah is best known for her leadership role in semantic web research, and for her work on explanation, trust, and applications of semantic web technology, particularly for scientific applications. Deborah is co-editor of the Ontology Web Language which has emerged from web ontology working group of the World Wide Web (W3C) semantic web activity and has now achieved W3C Recommendation status. She helped start the web ontology working group out of work as a co-author of the DARPA Agent Markup Language program's DAML language. She helped form the Joint EU/US Agent Markup Language Committee which evolved the DAML language into the oil-reference DAML OIL description logic-based ontology language. She is a co-author of one of the more widely used long-lived description logic systems (CLASSIC) from Bell Laboratories. Her work on languages (including OWL, oil-reference.html DAML OIL, OIL, CLASSIC, etc.) is aimed at providing languages that enable the next generation of web applications moving from a web aimed at human consumption to the semantic web aimed at machine consumption in support of intelligent assistants and web agents. Deborah is a leader in ontology-based tools and applications. She is a co-author and technical leader of the Stanford KSL ontology evolution environment. She also consulted to help VerticalNet design and build its Ontobuilder/Ontoserver ontology evolution environment. She also provided technical leadership for the Stanford project to help Cisco systems form its ontology evolution plan for its meta data formation work.

Deborah's main research thrusts are in languages, tools, and environments for the semantic web. Deborah leads the Stanford Inference Web (IW) effort. IW provides a framework for increasing trust in answers from heterogeneous systems by explaining how the answers were derived and what they depended on. Inference Web supports this goal by providing infrastructure and an implemented web-based environment for storing, exchanging, combining, annotating, comparing, search for, validating, and rendering proofs and proof fragments provided by reasoners and query answering systems. Inference web is being used as an infrastructure for explanations in a number of DARPA, DTO, and NSF projects and in a few demonstration systems including the Explainable Semantic Discovery Service and the KSL wine agent. Deborah led the wine agent project as an early semantic web services demonstration system that integrates explanation (via Inference web), semantic web languages (via DAML OIL and OWL), semantic web query languages (via OWL-QL), and web services (via OWL-S).

**Opportunities and Challenges in Crisis Informatics**
*Lea Shanley, Woodrow Wilson Center, lea.shanley@wilsoncenter.org*

Lea Shanley is a Senior Associate and Director of the Commons Lab within the Science and Technology Innovation Program, Woodrow Wilson International Center. The Commons Lab advances research and policy analysis on new technologies and methods, like social media and

crowdsourcing, which provide the tools to mobilize "digital volunteers" to support humanitarian aid and disaster response, collect actionable scientific data, and enhance citizen engagement in public decision-making.

Prior to this, Lea was a Postdoctoral Fellow on the Mapping Science Committee of the National Academy of Sciences, where she co-directed two NRC reports: Precise Geodetic Infrastructure: National Requirements for a Shared Resource; and New Research Directions for the National Geospatial Intelligence Agency. These reports recommended strategic S&T priorities for geodesy, hazards monitoring, and national security.

In 2009, Lea was an AAAS/ASA-CSSA-SSSA Congressional Science Fellow and the primary science adviser to the Chair of the Senate Subcommittee on Science and Space. She managed the Senator's priorities for federal R&D and crafted legislation addressing earth observation governance, oceans issues, and hazards research and mitigation.

Previously, Lea conducted community-based participatory action research in geographic information science at the University of Wisconsin-Madison. This research engaged local and tribal communities in the development and use of GIS-based decision support systems, enabling collaborative decision-making for improved emergency management, resource management, and land use.

Lea has served on professional committees, including the National States Geographic Information Council's Data Sharing Working Group and the Steering Committee for the Value of Information Workshop, hosted by Resources for the Future. She was an integral member of a leadership team that established the Wisconsin Geographic Information Coordination Council. Her awards include a NSF IGERT Fellowship for the Vespucci Summer Institute on Geographic information Science, Italy, with a focus on Spatial Data Infrastructures, and a Ford Foundation Community Forestry Research Fellowship.


## Insights and Opportunities in NASA's Disaster's Program
*Frank Lindsay, Disasters Program Manager, NASA Applied Sciences Program, Francis.Lindsay-1@nasa.gov*

As the Disasters Program Manager, Dr. Lindsay leads the Program's efforts to promote the integration of Earth science data and information for disaster forecasting, mitigation, and response.  He oversees the Disaster portfolio of competitively selected and directed projects focusing on improving our national and international planning for and response to disasters across the globe.  He is also the NASA representative for disasters work on several national and international bodies including the OSTP Subcommittee on Disaster Reduction and the Committee of Earth Observing Satellites comprised of the world's space faring nations.

He received a Ph.D. in Geography from the University of Maryland and a Masters degree in Geography from the University of Massachusetts, Amherst.  Dr. Lindsay has worked in the NASA Data System Program for nearly ten years as a Program Manager before joining the Applied Science Program.  He has extensive experience with geospatial data spanning both remote sensing and GIS-based applications.  Before joining NASA Dr. Lindsay managed one of the largest civilian remote satellite data distribution centers based at the Institute for Advanced

Computer Studies in Maryland and was an Assistant Professor of Geography at the University of New Hampshire, Keene.

### Interoperability ... Now what? - TED-style

*Karl Benedict, karl.benedict@gmail.com*

The technologists in the ESIP Federation have worked long and hard in achieving some hard fought progress towards standards-based interoperability for our data and products, but continue to struggle to move from implementation to adoption and use. In this presentation I will discuss where we are in terms of achieving interoperability for Earth science data as prelude to a discussion of what we need to do to achieve the impact that we all hope to obtain through increased availability and usability of Earth science information.

### Combining several innovative technologies: DAP, CDM and CF - Ignite

*James Gallagher, jgallagher@opendap.org*

Through their NOAA-funded grant, OPeNDAP and Unidata are working toward a new version of the innovative Data Access Protocol (DAP) that will enable web access to a vast amount of data using a synthesis of DAP, the Common Data Model (CDM) and the Climate Forecast (CF) standard.

### Data Curation for Excel: A new tool for scientists - TED-style

*Carly Strasser, carly.strasser@ucop.edu*

We have developed an open-source add-in and web application for scientists that will facilitate data management, data preservation, and data citation.  Both products help scientists determine whether their file is CSV compatible, help them generate metadata in a standard format, and guide them through deposition of their data into a repository.  We hope that the community at large will adopt and adapt the tool to meet their unique needs.

### Wordy Data - TED-style

*Chris Jenkins, Chris.Jenkins@colorado.edu*

Numeric data is easy, relatively. The challenges of word-based data mostly lie ahead of us. It is less precise, but it is so rich in information. Commerce is making great strides with semantic data: How transportable to the sciences are their technologies? What should be our corpus? Does science require higher standards on outputs? How does information become actionable? And how do we merge the numeric and the linguistic?

### The Knowledge Worker: integrating, manipulating, creating... stuff - TED-style

*Brian Wee, bwee@neoninc.org*

Management icon Peter Drucker first coined the term "knowledge worker" in the late 1950s.  The 1990s saw a resurgence in interest in the topic coincident with a rise of applications that sported graphical user interfaces (GUI).  There was a realization that GUIs provided a means by which

tasks could be virtualized to an extent that, with some training, people could execute such tasks fairly effectively to realize productivity gains.  Then the internet came along, and we now find ourselves in the age of the data deluge.  Are we at the confluence of social and technological changes that warrants a re-examination of what it means to be a knowledge worker?  What are the tools of the trade in the value chain of transforming data to information to knowledge?  What role does our community play in affecting the expectations required of a knowledge worker?

## Insects, instincts, and interoperability: organization and decision making at the gut level. - Ignite

*Reid Bohem, mboehm@utk.edu*

Birds do it, bees do it, yes even fleas do it... there are many instances where organisms living in units, colonies, swarms, and families use non-verbal communication and visceral cues to deliberate and decide major movements in daily life. Several scholars such as Peter Miller and Thomas Seeley have studied the nuances of communication in swarms that continue to be effective throughout the ages. This ignite talk poses the question: is it possible for humans to communicate, deliberate, and act effectively as a unit without language? What is the potential for interoperability among epistemic communities using systems that relate using the lessons learned from other species? I propose that there are advantages to systems and communication networks that employ such wisdom. Through discussion of experiences with synesthesia, honey bee and other species' behavior, and instances where organisms have fueled system design, we will begin a dialogue about interoperability based on instinct and the possibility of functional communication without words.

## New Dog You Met Conventions? - Ignite

*Ted Habermann, ted.habermann@noaa.gov*

Current granule metadata conventions are based on parameter-value approaches and do not include mechanisms for grouping related attributes to describe entities or objects. This limitation makes it difficult to address many common documentation needs. The ISO Standards include object models for people, citations, and online resources. Objects like these need to be incorporated into community conventions to insure interoperability and high-quality metadata that meets the needs of data providers and users.

## Production Data: Treating Data like Software - TED-style

*Jennifer Schopf, jmschopf@gmail.com*

I describe the production data approach to data curation. By treating data in a similar fashion to how we build production software, that data will be more readily accessible and available for broad re-use. Data curation is an ongoing process, which includes considering third-party contributions; planning for cyclical releases; bug fixes, tracking, and versioning; and issuing licensing and citation information with each release.

**Opensourc'ing BigData: Buzzword Soup that Matters - Ignite**

*Chris Mattmann, chris.mattmann@gmail.com*

NSF, NIH, DARPA, USGS, NASA and other government agencies are all spinning their heads trying to determine how best to deal with the data deluge called "Big Data", in the context of software, tools, communities, longevity and sustainability. In this talk, I present a framework for understanding the use and application of Open Source software development within the government as a powerful tool to deal with big data, and as a mechanism to achieve long-lived, sustainable software solutions within the space.

**Data Prospecting – a new approach to address "big data" exploitation challenges in Earth Science? - TED-style**

*Rahul Ramachandran, rahul.ramachandran@uah.edu*

There are typically two categories of data analysis, namely, data exploration and data mining. Data exploration focuses on manual methods brought to bear on data analysis such as standard statistical analysis and visualization. Data exploration usually requires small datasets. Data mining, on the other hand, is defined as "the nontrivial extraction of implicit, previously unknown, and potentially useful information from data" (Fayyad et al, 2008). Data Mining uses automated algorithms to extract useful information. Humans guide these automated algorithms and specify algorithm parameters (training samples, clustering size, etc.). Large datasets typically require data mining.

A new approach for exploiting "big data" is now possible with the availability of high performance computing and the advent of new techniques for efficient distributed file access. This new approach coined as "data prospecting" combines methods from both data exploration and mining. Just as prospecting focuses on locating the site within the vast land and determining the type of deposit that is located at that site. Data prospecting focuses on finding the right subset of data amongst all the data files and determining the value of the information contained within the subset.

This talk will explore the "data prospecting" concept and present results from the initial experiment and prototype.

**Keeping Up with Mobile Tools for Citizen Science: Digital Earth Watch - Ignite**

*Annette Schloss, annette.schloss@unh.edu*

Digital Earth Watch (DEW) is a program of activities and digital tools for citizens to monitor and understand change in their local environment. One activity, the Picture Post Network, engages users in taking and sharing on our website repeat digital photographs of their favorite monitoring site. As mobile technologies have been rapidly changing, our challenge is to keep up with these technologies and with the expanding technology capabilities of our users. This talk will show our progress from stand-alone digital camera to all-in-one mobile app (or at least the potential to go there!)

**Data to Knowledge to Action - Ignite-style**

*Eugene Kolker, eugene.kolker@seattlechildrens.org*

Data-Enabled Life Sciences Alliance International (DELSA Global, www.delsaglobal.org) is innovation during the whole life cycle of data in life sciences. It breaks open silos of knowledge to build an integrated and supporting ecosystem to handle the life cycle of life sciences data more effectively. Along with this ecosystem DELSA gathers diverse expertise from numerous fields and walks of life to build more insightful experiments that ask more effective questions and then facilitates the transformation of data to knowledge to action. DELSA grew out of a need that was recognized by many; and its mission is to "Accelerate the impact of Data-Enabled Life Sciences on the pressing needs of the global society".

**Sharing creativity: How the ESIP Federation leverages network effects, requisite variety, and the adjacent possible to make your team more innovative. - TED-style**

*Bruce Caron, bruce@tnms.org*

The earth system is astounding complex as an object of study. From observation to modeling this object challenges science and technology in many dimensions. To innovate our way through this complexity, we need to assemble teams that control a massive range of knowledge and skills. Sensor designers, satellite engineers, earth system scientists from a dozen disciplines, data managers, climate experts, computational algorithm experts, model builders, computer scientists, sociologists: these and more need to work in concert for us to create the answers our planet needs now.

In the corporate world the long-standing rule is this: you can grow creativity (hire more people), learn creativity (retrain your team), or buy creativity (acquire another company). All of these choices are expensive. Government agencies and universities need a better solution, and the ESIP Federation has found one: sharing creativity.

This talk will explain how participating in a virtual organization can foster creative capabilities in your existing team, build collective intelligence, and support rapid innovation. Through ESIP, your team can borrow the requisite variety of knowledge it needs to address the full complexity of its tasks and innovate comprehensive solutions; solutions that would not be otherwise available.

## Week At-A-Glance

| Day 1 - Tue, July 17 | | Day 2 - Wed, July 18 | | Day 3 - Thur, July 19 | | Day 4 - Fri, July 20 | |
|---|---|---|---|---|---|---|---|
| 8:00 | Registration Opens | 8:00 | Registration Opens *Memorial Union* | 7:30 | Registration Opens C&B Meeting | 8:00 | Registration Opens |
| 8:30 | Workshops | 8:30 | Plenary Session *Memorial Union* | 8:30 | Breakout Sessions | 8:30 | Breakout Sessions |
| | | 9:15 | Plenary Session *Memorial Union* | | | | |
| 10:00 | Break | 10:00 | Break | 10:00 | Break | 10:00 | FUNding Friday |
| | | 10:15 | Plenary Session Innovators Among Us *Memorial Union* | | | | |
| 10:30 | Workshops | | | 10:30 | Breakout Sessions | 10:30 | Breakout Sessions |
| 12:00 | Lunch | 12:00 | Lunch *Memorial Union* | 12:00 | Lunch | 12:00 | Lunch |
| 1:30 | Workshops | | | 1:30 | Breakout Sessions | 1:30 | End of Meeting |
| | | 2:00 | Breakout Sessions *Pyle Center* | | | | |
| 3:00 | Break | | | 3:00 | Break | | |
| 3:30 | Workshops | 3:30 | Break | 3:30 | Breakout Sessions | | |
| | | 4:00 | Breakout Sessions *Pyle Center* | | | | |
| 5:00 | End of Day 1 | | | 5:00 | End of Day 3 | | |
| | | 5:30 | Poster Session *Memorial Union* | | | | |
| 7:00 | Pub Crawl | | | | | | |
| | | 7:30 | End of Day 2 | | | | |

| Key | |
|---|---|
| Breakout | |
| Workshop | |
| Plenary | |

* All times in CDT

**NOTE Locations:**
Wed AM and Wed Poster Session are in Memorial Union

All other sessions are in the Pyle Center

## Tuesday, July 17 (Pyle Center all day)

| 8:00 | **Registration Open** *Outside the Robert P. Lee Lounge - Rm 109* | | | | | |
|---|---|---|---|---|---|---|
| 8:30 | E-Science Drupal Lab | Evaluating YOUR Project | Teacher Workshop | ESIP 101 | NASA Mini-Summit for Open Source | EarthCube Governance |
| | Room: 227 B. Caron | Room: 121 A. Prados | Room: 235 M. Mooney | Room:111 C. Meyer | Room: 335 C. Mattman | Room: 332 L. Allison |
| 10:00 | **Break** Robert P. Lee Lounge - Rm 109 | | | | | |
| 10:30 | E-Science Drupal Lab | Evaluating YOUR Project | Teacher Workshop | US GIN | NASA Mini-Summit for Open Source | EarthCube Governance |
| | Room: 227 B. Caron | Room: 121 A. Prados | Room: 235 M. Mooney | Room:111 S. Richard | Room: 335 C. Mattman | Room: 332 L. Allison |
| 12:00 | **Lunch** | | | | | |
| 1:30 | Discovery Hack-A-Thon | Evaluating YOUR Project | Teacher Workshop | ESIP Commons | DataOne Node | EarthCube Governance |
| | Room: 235 H. Hua | Room: 121 A. Prados | Room: 209/327 M. Mooney | Room:111 K. Benedict | Room: 335 M. Jones | Room: 332 L. Allison |
| 3:00 | **Break** Robert P. Lee Lounge - Rm 109 | | | | | |
| 3:30 | Discovery Hack-A-Thon | Evaluating YOUR Project | Teacher Workshop | Innovator Practice | DataOne Node | EarthCube Governance |
| | Room: 235 H. Hua | Room: 121 A. Prados | Room: 209/327 M. Mooney | Room:111 E. Robinson | Room: 335 M. Jones | Room: 332 L. Allison |
| 5:00 | | | | | | |

## Wednesday, July 18 (Memorial Union, morning and Pyle Center afternoon)

| Time | | | | | | |
|---|---|---|---|---|---|---|
| 8:00 | Registration Open<br>Great Hall, Memorial Union | | | | | |
| 8:30 | **Linked Data and Next Generation Science**<br>Deborah McGuiness, Tetherless World Constellation, RPI<br>Great Hall, Memorial Union | | | | | |
| 9:15 | **Opportunities and Challenges in Crisis Informatics**<br>Lea Shanley, Woodrow Wilson Center, Commons Lab<br>Memorial Union | | | | | |
| 9:45 | **Insights and Opportunities in NASA's Disaster's Program**<br>Frank Lindsay, NASA Headquarters<br>Memorial Union | | | | | |
| 10:00 | Break<br>Memorial Union | | | | | |
| 10:15 | Innovators Among Us<br>Memorial Union | | | | | |
| 12:00 | Lunch<br>Memorial Union | | | | | |
| 2:00 | **EarthCube Workflow**<br>Room: 332<br>Y. Gil | **Frameworks for Data Viz**<br>Room: 227<br>K. Ward | **Teacher Workshop**<br>Room: 209<br>M. Mooney | **Documenting Data**<br>Room: 335<br>T. Habermann | **Innovation through GIS**<br>Room: 235<br>T. Jasmin | **ESIP Testbed**<br>Room: 220<br>K. Keiser |
| 3:30 | Break<br>Lee Lounge | | | | | |
| 4:00 | **ToolMatch Party**<br>Room: 332<br>C. Lynnes | **Frameworks for Data Viz**<br>Room: 227<br>K. Ward | **Teacher Workshop**<br>Room: 209<br>M. Mooney | **Documenting Data**<br>Room: 335<br>T. Habermann | **Innovation through GIS**<br>Room: 220<br>T. Jasmin | **BOF**<br>Room: 220 |
| 5:30 | Poster Session & Reception<br>Memorial Union | | | | | |

## Thursday, July 19 (Pyle Center all day)

| 7:30 | Registration Open<br>Outside the Robert P. Lee Lounge - Rm 109 | | | | | |
|---|---|---|---|---|---|---|
| 7:30 | C&B Breakfast - C. Lenhardt<br>Room: 111 | | | | | |
| 8:30 | **Using Tech Tools** | **EarthCube Data Discovery** | **Cloud Comp Big Data Apps** | **Energy/Climate Workshop** | | **BOF** |
|  | Room: 235<br>M. Mooney | Room: 332<br>R. Ramachandran | Room: 111<br>T. Huang | Room: 327<br>S. Kumar | Room: 227 | Room: 220 |
| 10:00 | Break<br>Lee Lounge | | | | | |
| 10:30 | **NASA HDF/HDF-EOS** | **EarthCube Cross-Domain Interop** | **Cloud Comp Readiness** | **Energy/Climate Workshop** | **Metadata Casting** | **BOF** |
|  | Room: 235<br>J. Lee | Room: 332<br>I. Zaslavsky | Room: 111<br>P. Yang | Room: 327<br>S. Kumar | Room: 227<br>B. Wilson | Room: 220 |
| 12:00 | Lunch | | | | | |
| 1:30 | **Moving Forward ESC** | **Earthcube Gov Rdmap** | **Opportunities for Cloud** | **Air Quality** | **Building GIS Hosting Env.** | **BOF** |
|  | Room: 235<br>C. Lynnes | Room: 332<br>L. Allison | Room: 111<br>P. Yang | Room: 327<br>G. Lough | Room: 227<br>M. Austing | Room: 220 |
| 3:00 | Break<br>Lee Lounge | | | | | |
| 3:30 | **Discovery Catalog Open Source** | **EarthCube Brokering** | **Innovators Among Us Debrief** | **Realities of Identifiers** | **OPeNDAP OPULS** | **BOF** |
|  | Room: 235<br>K. Casey | Room: 332<br>S. Browdy | Room: 111<br>K. Benedict | Room: 327<br>N. Hoebelheinrich | Room: 227<br>J. Gallagher | Room: 220 |

## Friday, July 20 (Pyle Center all day)

| 8:00 | Registration Open<br>*Outside the Robert P. Lee Lounge - Rm 109* | | | | |
|---|---|---|---|---|---|
| 8:30 | **Data Stewardship Planning** | **NOAA Data Mgmt Dashboard** | **ESC Hack-A-Thon** | **BOF** | |
| | Room: 235<br>C. Tilmes | Room: 332<br>M. Austin | Room: 327<br>C. Lynnes | Room: 220 | |
| 10:00 | Break & FUNding Friday!<br>Lee Lounge | | | | |
| 11:00 | **Discovery Planning** | **Info Quality Planning** | **BOF** | | |
| | Room: 227<br>H. Hua | Room: 121<br>B. Maddux | Room: 220 | | |
| 12:30 | Box Lunch | | | | |

# President's Fitness Meet-up

- What: ESIP President, Karl Benedict, is coordinating a meet-up to run, walk, jog or any combination for an hour
- Who: You!
- Where: Edgewater Hotel lobby (666 Wisconsin Ave)
- When: Tues – Fri, 6 am

More details or questions? Email Karl, kbene@edac.unm.edu
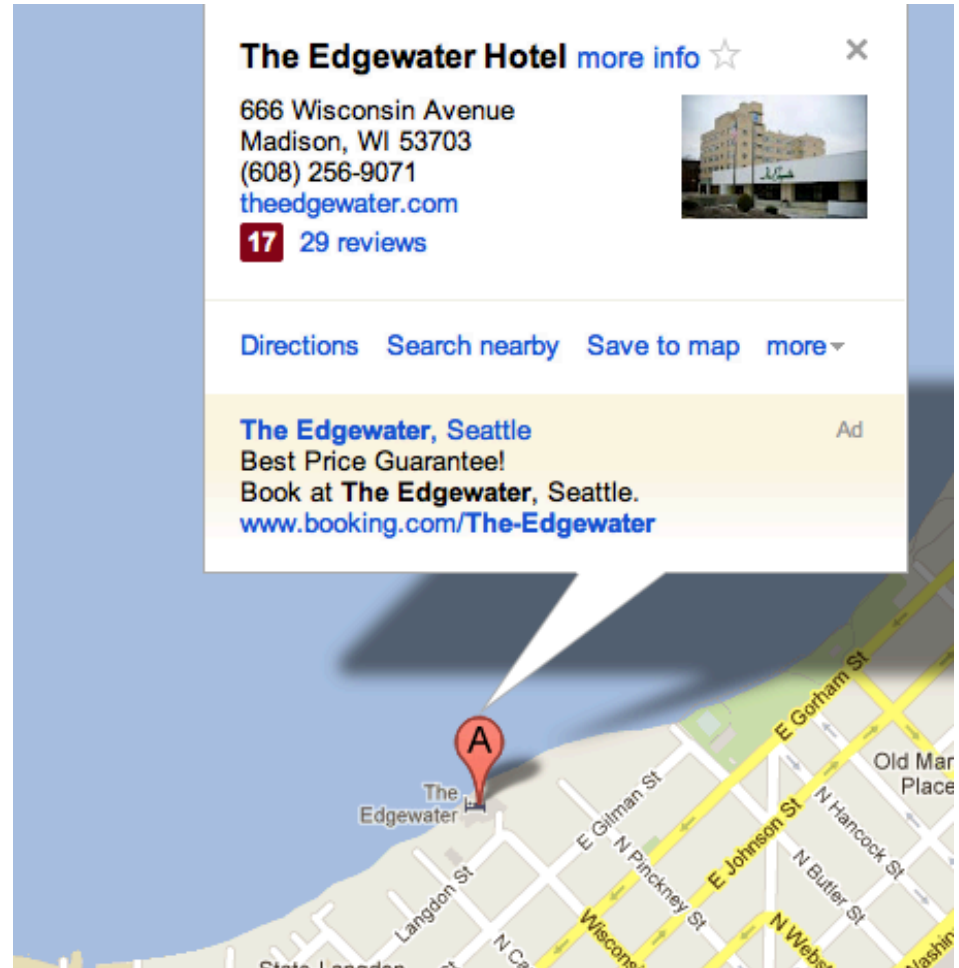
# ESIP FUNding FRIDAY!

**What:** Annual mini-grant poster competition to seed ESIP collaborations

**Prize:** Three $5,000 awards to ESIP members and two $3000 awards for student entries.

**How to enter:** Create a poster (Posters can be hand drawn) and give a 2-minute pitch for your project idea Friday, July 20 at 10 am.

**Who:** Registered meeting participants who are members of the ESIP Federation and MUST BE PRESENT AT THE FUNding FRIDAY POSTER EVENT TO COMPETE! Federal employees must check their eligibility to participate and funding is available only to partners from US-based organizations.

### 2011 Winning Ideas:
- Ruth Duerr, Joe Glassy - Demonstrating Preservation Connections Using OAI-ORE
- Annette Schloss - Digital Earth Watch in Action
- Jesse Roberts - Engaging Climate Change Learners in Public School Settings
- Karl Benedict, Rafael Ameller -Enhanced Collaborative Disaster Management Through Interoperable Data Visualization
- Eric Rozell, Tom Narock - Linked Open Research Data for Earth & Space Science Informatics
- Oleg Aulov - Self-Organizing Maps for Automated Oil-Spill Detection

For full details see: http://commons.esipfed.org/node/490

# ESIP Program Corrections

Wednesday, July 18 –
- Documentation is in Rm 327
- GIS Session is in Rm 235 entire afternoon

Lunch Tuesday and Thursday will be in
  Lowell Center Dining Room.

# AGU Sessions Shared by ESIP Members

*Please note – the deadline for abstracts is 8 August 2012, so please plan accordingly and submit your abstract soon. The first author must be an AGU member or sponsored by a member.*

**A045. Integrated Model-Observation Test Beds -** Weather and climate model development is being transformed by model-observation test beds. Within test beds, parameterizations can be developed and tested quickly, uncertain constants can be constrained by observations, and existing models can be evaluated. We will solicit contributions from weather and climate researchers operating at the intersection between observations and model development, who utilize test bed concepts and constructs to make model simulations and predictions more accurate and realistic. Contributions describing interactive modeling and observational studies using multiple datasets to address specific model shortcomings and papers coupling the test beds with uncertainty quantification methodologies will be especially encouraged. http://fallmeeting.agu.org/2012/session-search/single/integrated-model-observation-test-beds/

David Arctur

**ED004: Climate Literacy: Barriers, Misconceptions, and Progress in Improving Climate Literacy -**

Tamara Ledley (CLEAN)

**ED005: Climate Literacy: Bridging Formal/Informal Learning Environments to Support Deep Investigations of Climate Science -**

Tamara Ledley (CLEAN)

**ED006: Climate Literacy: Education for Decision Makers, Religious Communities, and Professional Audiences -**

Tamara Ledley (CLEAN)

**ED007: Climate Literacy: Enabling Responsible Decisions Through Informal Education, Public Outreach, and Community Groups -**

Tamara Ledley (CLEAN)

**ED008: Climate Literacy: Evidence and Best Practices from Research and Evaluation -**